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Contractors' Confidence

UNITY DEMONSTRATED AT FOLKESTONE

PRIVATE electrical contractors are operating at present in a state of uncertainty which is good neither for themselves nor for the public. Further, it is harmful to the electricity supply industry to whose new owners the uncertainty is due. It is true that competition in installation work by the electricity suppliers is no new thing, for most companies and many municipal authorities indulged in it. The contractors' fear is that what was once part of a patchwork may now become a general pattern.

This, rather than technical or purely commercial considerations, was the dominant note at last week's Folkestone conference of the Electrical Contractors' Association—an event resuscitated after a ten-year gap. Many feel that the contractors would have been wiser to have revived the annual conference last year. There was a fear then that support might have been inadequate, but this year's experience, in spite of continued apprehension, seems to have refuted this assumption.

Record Attendance

It would not be true to say that fear rather than fellowship was responsible for a record attendance, but the obvious need for a united front at the present time undoubtedly acted as a strong incentive.

The proportion of guests this year was smaller, although in actual number there seemed to be no decline. Manufacturers were strongly represented, but the electricity supply section was not, at least in number. It is most regrettable that circumstances prevented Lord Citrine from being present as he had intended, but one member of the B.E.A. (Dame Caroline Haslett) and the secretary (Mr. H. F. Carpenter) were there. The Area Boards, with whom the contractors are most closely concerned, were, with one exception, unrepresented. No doubt the explanation is that the British Electrical Power Convention, a week or two earlier, had provided an opportunity for the two sides to get together, and the Folkestone gathering was regarded as a purely domestic affair.

Militant Attitude

On the whole the tone of the conference was aggressive. Both supply authorities and manufacturers were subjected to some straight talking, but they declined to be "drawn" at the meetings, whatever was said in private. While the contractors' feelings must receive sympathy it is fair to say that a little more conciliatory spirit might not have been out of place. After all the Association claims in the first half of its motto to be *suaviter in modo*. Maybe the members' suspicion that some of the Area Boards were inclined to be somewhat *fortiter in re* was justification for the lapse.

However that may be, the conference was undoubtedly worth while. It demonstrated to the rest of the industry that the electrical contractors are united in their determination to survive and to maintain and improve the service to the public which they have provided for half a century or more.

CONTRACTORS AND CONSULTATION

ONE of the speakers in the discussion on Mr. M. R. H. Sadler's paper at the E.C.A. Conference suggested that the contractors should endeavour to secure representation on the Electricity Consultative Councils. The terms of Clause 7 (2) (b) seem to make this possible, for the members of a Council are to represent various interests including "other persons or organizations interested in the development of electricity in the area." Whether the Minister of Fuel and Power would agree is perhaps debatable, but at all events contractors should take steps to put their views before the Councils, as Mr. Sadler suggested in his reply.

WAXED-RUBBER INSULATORS

GLASS insulators on overhead telegraph lines in some parts of the United States are subject to much wilful breakage. After attempts to render glass less liable to damage, a vulcanized rubber compound has been developed which appears to be reasonably satisfactory. It is of the wax-bearing kind; the wax "blooms" (migrates to the surface) continuously for years, thereby enabling the surface to remain "not-wetting" in rain and heavy fog. The composition and extent of the wax ingredient are principal features of the Western Union patents covering the manufacture of these insulators, which are claimed to be reasonably self-cleaning and nearly free from surface deterioration when exposed to strong sunlight.

RAILWAY MOTORS

EFFICIENCY plays but a minor role in the design of traction motors. If better efficiency means greater weight, it will tend in general to be offset by the added expense of hauling the extra weight about. The designer's primary object is, therefore, minimization of weight. Until fresh insulating materials become available and/or higher working temperatures are permissible, the principal way in which h.p./lb can be raised is likely to remain that of increasing the motor speed. The size of motors for internally powered locomotives is being reduced to the point at which the wheel diameter, instead of being governed by motor size, is now in some cases, on the heavier locomotives, being determined by the weight on the driver; that is, by the lb/sq in pressure on the track rail. This is a new situation, which is welcomed in the United States as a possible aid to standardization. If the wheel rather than the motor does become the limiting factor, then there will be more freedom of choice of gearing for small motors; conversely, a more universal type of motor not needing special gearing may be practicable.

VAPORIZATION COOLING

A METHOD of cooling large rotary electrical machines which is as revolutionary as hydrogen gas cooling at first seemed has been described in the United States. Heat is removed "as evenly as it is generated" by water changing from the liquid to the vapour state. It is sprayed in at one end and sucked through the gap between rotor and stator by vacuum into a condenser at the other end. Air vents, which make up from 4 to 12 per cent of the core length, are not needed so that the solid stator can be made explosion-proof and corrosion-proof and its circumference becomes the outside of the machine. Compared with air cooling, the heat transfer coefficient is declared to be fifty times as great. Compared with the use of hydrogen gas, the vaporization method does not need a heavy housing, purifiers, or shaft-sealing devices; all the auxiliaries, with the exception of a thermostat, can be mounted on the machine itself.

VAST TRANSPORT SCHEME

THE "Working Party" of the London Railway and London Transport Executives has put forward proposals for the execution of one of the biggest transport schemes ever conceived. It involves in all the construction of about 50 miles of new "tubes" of various diameters (the present length of London "tubes" is 66 miles), and the electrification of lines out of London over a wide radius. It is proposed that the work should be spread over a period of between 20 and 30 years. A total expenditure of £238 million is envisaged on the tube section of the programme and the associated electrification and improvement of surface lines is expected to cost a further £100 million. Much of this will go to the electrical industry.

Contractors' Conference

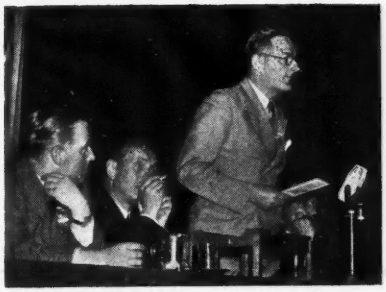
SUCCESS OF FIRST POST-WAR GATHERING

FOR the first time since 1939 the Electrical Contractors' Association, with its allied organizations N.E.C.T.A., Ltd., and the National Federated Electrical Association, gathered in conference, Folkestone being chosen for the purpose.

Although there seems to have been some earlier doubt whether sufficient support would be gained for the revival of this annual assembly, the event showed that any qualms were entirely unjustified. In fact, the attendance of about 600 exceeded any pre-war total and the proportion of members (about seven-eighths) was also higher than usual. Folkestone is a pleasant place, the weather was perfect and the civic authorities went all out to make the conference a success.

Many well-known figures in all branches of the industry were seen at the reception at the Hotel Metropole, on Wednesday, 29th June, by the president (Mr. J. G. Briggs) and Mrs. Briggs, supported by the Mayor and Mayoress of Folkestone (Alderman C. E. Lister and Mrs. Lister). The reception was followed by dancing and a cabaret.

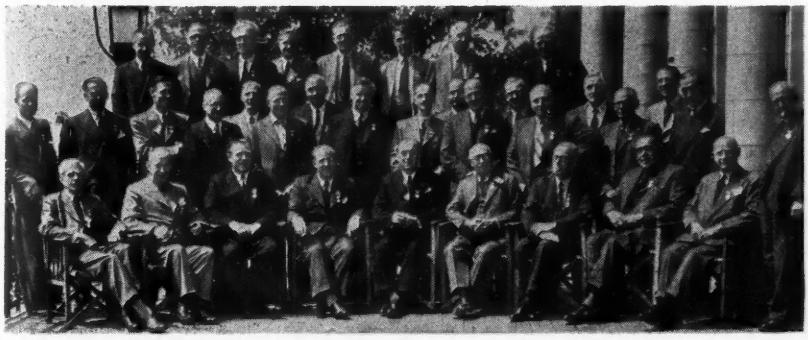
Business started on the Thursday morning at the Leas Cliff Hall when the Mayor, extending a civic welcome to the delegates, said that the number present



Mr. M. R. H. Sadler reading his paper

indicated that the Association was by no means a dying concern. He contrasted the impersonal character of monopolies with the contractors' personal contacts with the public.

After Mr. Briggs had thanked the Mayor, Mr. L. C. Penwill, the director and secretary, expressed regret that Lord Citrine (chairman of the B.E.A.), who had intended to be present, had been prevented by events in the power industry from coming to Folkestone. Mr. Penwill also announced that they had as an honoured guest at the conference Mr. E. Buttner, vice-president of the National Electrical Contractors' Association of America, who was anxious to discuss with members the experiences and problems of contractors on both sides of the Atlantic.



The new Council of the Association

Mr. Briggs then delivered his presidential address (summarized in our last issue) which was evidently appreciated by

Mr. H. F. Carpenter (Secy., B.E.A.), Mr. T. R. Priest and Mrs. Carpenter

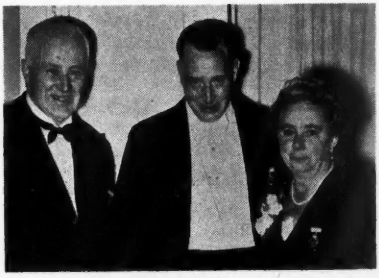
those present, particularly those sections relating to the contractors' long-standing grievances.

After an interval the president introduced Mr. M. R. H. Sadler, vice-chairman of the Executive Committee, who, he said, was now one of the oldest members of the Committee in service though one of the youngest in years. Mr. Sadler presented his paper "Electrical Contracting and Retailing: the Present and the Future," an abstract of which appeared in last week's *Electrical Review*.

The discussion was opened by Mr. W. Cross (Newcastle-on-Tyne), a past-president of the Association. He spoke of the role of the contractors as canvassers and agents for the supply authorities. He said that they should still keep in touch to help those authorities and continue to give good service, although this was difficult if they had to charge the same prices as those of multiple stores which gave no service. There was a great need for standardization of equipment and for the simplification of rules, regulations and specifications. Speaking of training, Mr. Cross said that many craftsmen with little academic knowledge were still the most efficient. The industry required 80 per cent of the apprentices to be craftsmen and the remainder technicians.

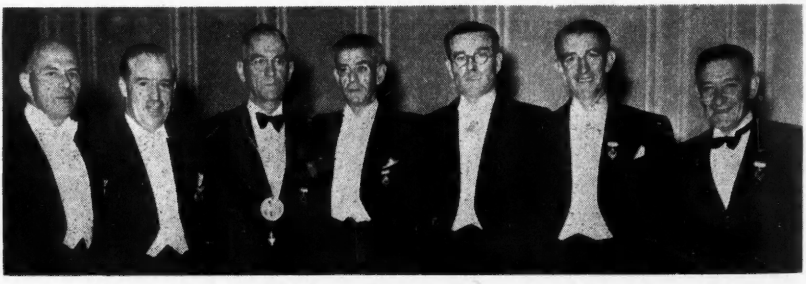
When the discussion was resumed in the afternoon the president called on Mr. E. Buttner (U.S.A.) who expressed his pleasure at being invited to the conference. He thought that some of the present problems before the British contractors were the future problems of the American industry.

Mr. F. Hancock (Fenton) urged that



Mr. John Marshall (Cheltenham) with Mr. and Mrs. I. McVean (Winchester)

the question of competition with the contractors by the Area Boards should be made a political issue and that Opposition members should be asked to take up their



Liverpool Contingent with Mr. S. Dickinson, the new president: Left to right, Messrs. A. V. Milton, S. Dickinson, R. J. Chatham, T. K. Richardson, W. T. Trace, T. Jones and A. Winstanley

case in Parliament. They should not wait until the Boards had spent enormous sums on services already provided by the contractors. A small sub-committee should be set up for this purpose.

Mrs. I. McVean (Winchester) put in a word for manufacturers. She said that they had got over their post-war difficulties and appliances now needed much less after-sales attention. It was necessary for the industry's future to provide full-time tuition for apprentices. The B.E.A. was setting an example in the training of employees. Mrs. McVean said that contractors should not dwell upon the rather gloomy present but look forward with hope to the future. Wisdom, courage, foresight, personality and individuality, with a refusal to lower the standard of work, would lead to success.

Mr. R. A. Marryat (London) endorsed the appeal for the exchange of knowledge and experience between the members, particularly through the Association's

PERSONALITIES AT FOLKESTONE

1. The President and Mrs. Briggs with the Mayor and Mayoress of Folkestone. 2. Mr. J. R. Harding (Southampton), Mr. L. C. Penwill (Director) and Mr. Smith (Swansea). 3. Mr. A. Brammer (A.S.E.E.) greeted by the Mayoress. 4. Two past-presidents, Messrs. T. E. Alger and W. H. Walton. 5. In this group are Mr. and Mrs. W. Lewis Smith, Mr. and Mrs. M. K. Neville, Mr. F. Winstanley, Mr. H. A. Deacon, Mr. and Mrs. A. E. Page and Mr. and Mrs. A. B. Wildsmith. 6. Messrs. S. G. Elliott Smith, A. F. Plummer and E. B. Sawyer. 7. Mr. E. J. Vidler, Mr. W. G. Turner, Mrs. Butterfield, Mr. F. M. Butterfield, Mr. W. H. Copper and Mr. J. Dunford-Smith

journal, upon such subjects as the interpretation of I.E.E. Regulations, organizations built up for special kinds of work, the training of boys, new plant and

Left: Mr. E. Buttner (U.S.A.). Right: Mr. Briggs hands over the presidency to Mr. Dickinson

equipment, relative costs of new and old methods, etc. He thought that a boy who had passed the City and Guilds examination and had satisfactory training and experience should be granted a full electrician's certificate which should be the minimum qualification for higher pay.

In the opinion of Mr. G. N. Walker (Birmingham) if more contractors had set up good retailing establishments there would now be something for the B.E.A. to think about. The Electricity Boards started with unfair advantages in the way of capital.

Miss K. Taylor (Preston) considered that the Boards were antagonistic to electrical contractors, especially the North Western Board, which was prepared to offer hire-purchase terms which were impossible to the contractor. She mentioned the possibility of securing more just treatment through Chambers of Trade. There was much apathy among contractors themselves; there should be advertising on a tremendous scale. Members of the Association's Council should try to visit every branch.

Although, said Mr. A. O. Bruty (Dublin), they had worked in Ireland for fifteen years under nationalized electricity supply, with contracting and retailing departments, the bulk of the electrical installation work was still carried out by reputable private contractors. He attributed this to the personal service which the contractors provided. Why did Mr. Sadler want compulsory registration? If electricity was dangerous it was also dangerous to walk along a road. Grading of operatives was desirable and necessary but those on the lower levels would always want the higher rates.

Mr. T. R. Priest (Blackheath, Birmingham) said that although in the Midlands there had been power company competition for fifteen years the contractors had continued to thrive. He suggested that contractors should send their female staff to B.E.A. demonstrations.

Mr. M. E. Broadbent (Huddersfield) said that the great majority of members had small businesses employing fewer than six journeymen. It was these the E.C.A. must fight for. With their personal service, they were the foundation of the electrical contracting industry.

Mr. A. S. Redvers Pratt (Bradford) maintained that the public would always prefer to deal with a person rather than a "robot" and they had nothing to fear. The task of the B.E.A. was to provide cheap electricity.

Mr. A. M. Turner (Altrincham) said

The Conference Stewards: Messrs. A. Apps, J. H. Coupland, E. R. Longley, W. J. Court, W. L. Pitcher, E. J. Saunders, J. W. H. Pemble, W. H. Agar and C. Innocent

General view of the garden party at Connaught Park, Dover

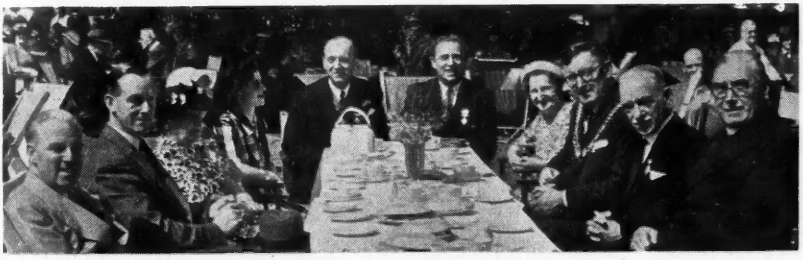
that to-day political considerations were greater than technical matters. They must make it clear to the Opposition parties that they expected a change if there was a change of Government. Theirs was the only trade competing with a nationalized undertaking; this should appeal to the public's sporting instinct. He thought the E.C.A. would have to tackle the problems of pensions, sick pay, etc., for employees. It was possible that compulsory registration might be used to victimize the trade. Contractors should consider the possibilities in the electro-chemical and electronics industries as well as other specialized services.

Mr. T. C. Gray (Newcastle-on-Tyne) said that if there were compulsory registration there should be some court of appeal. If only qualified people were allowed to supply wiring accessories much of their troubles would disappear. Mr. Gray said that contractors had had little trouble from the North Eastern Board.

In the course of his reply, Mr. Sadler agreed with most of the speakers' points. He did not think that there was a "crisis" and if the contractors stood together there would be no crisis. The whole discount structure needed overhauling but it would have to be a gradual change. Contractors ought to put their views to the Consultative Councils.

The evening was devoted to a ball and supper at the Leas Cliff Hall at the invitation of the Mayor of Folkestone, who with the Mayoress and Mr. and Mrs. Briggs received the guests.

Friday's proceedings commenced with the annual general meeting. After an interval Mr. Briggs introduced his successor as president, Mr. S. Dickinson (Manchester). In a short address Mr. Dickinson called for confidence and unity and paid a tribute to the director, Mr. L. C. Penwill.



The President's table at the garden party

Mr. Briggs then thanked all who had helped to make the conference a success.

The Mayor made a brief speech in reply and then Mr. T. E. Alger proposed a vote of thanks to the president and Mrs. Briggs.

In the afternoon a number of motor coaches conveyed the delegates to Connaught Park, Dover, where a most enjoyable garden party had been arranged.

The evening function was a smoking concert and dance at the Metropole.

Views on the News

By REFLECTOR

AFTER the transfer of the main functions of municipal undertakings to the Boards many of them still carried out certain work on the accounts side on behalf of the Boards. The prospect of final severance is not regarded with favour, and at Darlington, I see, the Council has expressed the view that it would be better if it continued to collect both gas and electricity accounts. The principle was carried a stage further in the presidential address of Mr. Henry Brown recently to the Institute of Municipal Treasurers and Accountants. He wondered whether they could seriously contemplate the permanent separate establishment of local organizations in, say, a county borough, for hospital services, electricity, gas, possibly transport and water, as well as insurance, employment and fuel control. As far as electricity is concerned, the natural centre is the showroom, and I cannot see that anything is to be gained by alliance with such a heterogeneous collection of services.

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The B.E.A. does not let grass grow under its feet. That, in fact, is what is complained of at Newton Abbot. Some time ago, a correspondent tells me, Councillor Miss H. Maddicott wrote to Lord Citrine regarding the use of Osborne Park as a coal dump for the adjoining power station. The chairman of the B.E.A. directed that the park should be freed, and the Authority undertook to sow the land with grass. It was pointed out that the correct time for sowing was in the autumn, but the Authority insisted that the work should proceed. Now the Council's surveyor has written holding the Authority responsible for reinstatement should the grass fail and the park has to be resown.

★ ★ ★

Colourful accounts appeared in the Press of what is said to have happened in the village of Finninglev, near Doncaster, one day last week. Electric cookers and clocks became red hot, radio sets caught fire, refrigerators got hot instead of cold, and a lamp at the local inn "shone like Blackpool illuminations." A woman who was ironing her husband's trousers, after burning a hole through them, found that the electric iron was "white hot." An official of the Electricity Board stated that a defect had developed in an overhead line, due to the burning out of a connector at the transformer, and had caused a rise in voltage.

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Scotsmen who grumble about "remote control from Whitehall" may be as surprised as I was to learn that for the past year the South West Scotland Electricity Board has been the responsible authority for the Falmouth electricity undertaking in distant Cornwall. The Minister of Fuel and Power has now made an Order transferring the undertaking to the more local control of the South Western Electricity Board. At the same time the Dartmouth and Kingswear undertakings go from the East Midlands Board to the South Western Board. The explanation is that the Falmouth undertaking was formerly administered by the Electric Supply Corporation, whose main undertaking lay in S.W. Scotland. Similar circumstances apply in the case of Dartmouth and Kingswear, which were formerly with the Urban Electric Supply Co. and were transferred with the main undertaking to the East Midlands Board.

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With sales resistance growing in the United States the latest domestic electrical appliances produced there incorporate features which, even if sometimes of doubtful practical value, at any rate provide useful selling points. One vacuum cleaner, for instance, will move forward itself on most rugs or as the advertisement says, "It walks—you merely guide it." I don't know whether there is any great advantage to be gained by being able to wash and wring clothes at three speeds, but possibly some of the more delicate fabrics may be damaged if too high a speed is employed. Efforts towards novelty seem to have been strained with regard to electric clocks, models now including designs in the shape of chefs and teapots.

North of Scotland Board

REVIEW OF PROGRESS IN 1948

WORK is now being carried out by the North of Scotland Hydro-Electric Board on a programme for the generation, transmission and distribution of electricity with a value of nearly £100,000,000. This is one of many impressive facts given in the 1948 annual report of the Board published on Monday.

Of the new hydro-electric schemes planned, the first two (at Morar and Lochalsh) came into operation last December and a further twelve stations with a total capacity of 423,000 kW were already under construction at the end of the year. Thirty-two turbines and twenty-six alternators for these stations are being built in Scotland. Taking all the hydro-electric schemes which were being surveyed, promoted or constructed during 1948, the aggregate capacity is about 800,000 kW and the estimated annual output 2,200 million kWh, equal to more than 50 per cent of the present consumption in the whole of Scotland.

At the end of the year 6,759 workers were directly engaged on the construction of hydro-electric works and the erection of transmission and distribution lines (8,041 at the end of May, 1949). The Board is constructing a "Highland Grid" to interconnect the major generating stations, and part of this work will bring an increased power supply to Aberdeen and Dundee areas.

As a result of the Electricity Act, 1947, the Board became responsible for generation, transmission and distribution in an area of approximately 21,600 square miles, which includes the cities of Aberdeen, Dundee and Perth. It operates nine hydro-electric, six steam and thirty-two diesel stations, with a total capacity of 250,548 kW. Electricity generated at these power stations during the calendar year (including the first three months when many of them were not under the Board's control), amounted to 741.3 million kWh, of which water power produced almost 50 per cent. The Board exported to the British Electricity Authority's grid in Central Scotland 79 million kWh during the period 1st April to 31st December, 1948.

The Board's distribution system provides supplies to approximately 700,000 people; during 1948 an additional 78 villages and hamlets were served and in the whole of the area some 45,000 people received a supply for the first time. The extent to which people in rural districts are taking advantage of the facilities offered is exemplified by the case of Lochalsh where 90 per cent of the possible consumers have been connected. Last year the average number of kWh sold to these domestic consumers was 1,370, and over a third of them (36 per cent) had electric cookers.

The accounts of the Board show a trading loss of £35,635 which, together with the loss of £38,710 brought forward, makes an accumulated deficit of £74,345 to be carried forward. At the end of the year the Board introduced a uniform basis of charge for the whole of its area by which 88 per cent of all classes of consumer are charged under the same tariff. The remaining 12 per cent, in isolated areas served by diesel plant, pay on the same basis but at a slightly higher rate.

The report contains many excellent photographic reproductions, three of them in colour.

Studying American Methods

AN expert panel set up by the Anglo-American Council on Productivity left yesterday for the United States to study the application of simplified practice in American industries and the applicability of similar techniques to British industries. The Panel will follow the course charted by the Anglo-American Council at its second session in April, when emphasis was laid on standardization, simplification and specialization: the Council attaches particular importance to the immediate benefits to be derived from the intermediate process towards full standardization, known as simplified practice, which aims at limiting the ranges of sizes or grades of products in order to cut costs and increase output by enabling longer runs to be made in production processes.

The Panel will hold discussions with U.S. Government agencies, national organizations, trade associations and firms. Its aim will be to form an appreciation of what has been achieved in this field, the methods employed, the degree of success and the effect on productivity and cost. The Panel will also have the task of assessing how far this experience could be adapted to British conditions and the extent to which it would be of benefit to British industry.

The members of the Panel are Major

General J. S. Crawford, vice-president of the Society of Motor Manufacturers and Traders; Mr. C. A. Martin of the British Thomson-Houston Co., Ltd.; Mr. Robert Neill, director, Lucas Electrical Co., Ltd.; Mr. G. Weston, deputy director, British Standards Institution; Mr. Bertram White, technical director, Federation of British Industries; and Mr. C. J. A. Whitehouse, secretary to the Ministry of Supply Committee on Standardization.

A productivity team from the pressed metal industry has also arrived in America and will be away for about six weeks. It will inspect about fifteen plants in the United States.

Cyprus Power Plan

NEW STATION AND ISLAND-WIDE DISTRIBUTION

At present, the supply of electricity in the island of Cyprus is confined to a few municipalities with the areas immediately adjoining them and to installations owned and operated by several mining undertakings. These plants, which have an aggregate capacity of some 10,000 kW, are very scattered and in many instances old and uneconomical to run, the supplies given being both inadequate and precarious. A small amount of new plant is being provided with the assistance of the Cyprus Government to overcome the most serious cases of inadequacy, but even with this the existing demand is not being met and no immediate development is possible.

To rectify this situation, island-wide electrification is proposed and the Cyprus Government has accepted a scheme prepared by Preece, Cardew & Rider, consulting engineers, comprising a 70,000 kW station at Larnaca, on the south coast, with a distribution network to serve all parts of the island.

The constructional work will be carried out in stages, the extent and timing of which will be determined by the rate of development of the demand. The first stage, which has already been authorized by the Government, includes part of the power station with 28,000 kW of generating plant, and the main 66 kV and 11 kV transmission lines necessary to give bulk supplies to all the principal towns, except Paphos in the extreme south-west, and also to the main mining and industrial areas.

In the design of this new station, the consulting engineers are collaborating with Sir Cyril Kirkpatrick & Partners, consulting civil engineers. The climatic conditions in Cyprus have made possible the adoption of semi-outdoor design, with a resulting substantial saving in building costs as compared with the more usual structure.

The main generating sets will be steam-driven turbo-alternators, using sea water for condenser cooling. The boilers will be oil-fired. The first orders were placed some months ago, three boilers of 90,000 lb/hr continuous rating having been ordered from John Thompson & Co. and the turbo-alternators (two of 7,000 kW and one of 14,000 kW capacity) from Metropolitan Vickers Electrical Co., Ltd. More recently, a 750 kW house-service diesel alternator set has been ordered from Harland & Wolf, and further contracts are expected to be placed shortly.

The design of the main transmission system is also well advanced and includes a 66 kV ring, partly double circuit, linking up Larnaca, Limassol, Troodos, Lefka and Nicosia, with spurs from Nicosia to Kyrenia on the north coast and from Larnaca to Famagusta, the chief port. A secondary 11 kV network, part of which will be carried on the same supports as the single 66 kV circuits, will give bulk supplies and feed low-voltage distribution mains. The first stage of transmission comprises some 67 miles of double and 36 miles of single 66 kV circuits, 85½ miles of combined 66 kV and 11 kV circuits and 67½ miles of 11 kV single circuit. The present systems operating at 6.6 kV or similar voltages which exist in some areas will be retained for the time being, but it is the intention that the use of all intermediate voltages between the 11 kV network and the low-voltage mains will ultimately be discontinued.

The first stage of the whole scheme is being expedited, and it is hoped that in 1951 the new system will be available to relieve the existing overloaded power stations and enable obsolete plant to shut down. Where existing plant is more modern and efficient, such as that owned by the mining companies, it is hoped to link it with the new system.

Aluminium Conduit

Conduit and fittings of aluminium and its alloys for enclosing electrical wiring are the subject of a leaflet issued for the guidance of users by the Aluminium Development Association. It specifies materials suitable for making tubes, fittings (both wrought and cast) and screws; then gives advice on thread cutting, bending, fitting and the simple precautions to be observed in damp situations.

Cable Fault Finder

Improved Apparatus of Greater Sensitivity

By
F. E. PLANER
Ph.D., M.Sc.
(Addison Electric Co., Ltd.)

AURAL exploration, with the aid of a pick-up search coil and telephone ear-piece, of changes in the intensity of the magnetic field set up by a.c. in a conductor is an old way of detecting faulty buried cables. Its advantages are well known, but inductive methods become unreliable in the case of lead-covered and armoured cables by reason of the fault currents that flow in the sheaths, when the latter make contact with the conducting core at the point of fault; also because of the magnetic shielding effect of the steel armouring.

New apparatus is now available of greater sensitivity to detect faulty lead-covered or steel armoured cables; mining and underground railway cables having single or double screens; telephone cables conveying very small signal currents, or twisted pairs in which one of the conductors acts as the return path for the signal current; also river cables as well as overhead lines.

A conductor carrying 1 mA can be detected 45 feet away, while both sides of a telephone conversation on a normal twisted indoor cable system can generally be picked up at over 5ft from the cable.

The apparatus may be used for finding difficult faults when the usual methods are of little avail, e.g., when the conductors of a multi-cored cable are interrupted, or even fused and faulted to ground, and no other cables lie near which could be used as return paths.

Faults of this type occur on aerodrome sites. They are usually located by digging up and cutting the cable at different points, an expensive procedure involving much labour and considerable time.

Faults of a similar type are encountered when automatic circuit breakers do not operate promptly; the conductors fuse at the point of the fault and short-circuits between conductors and ground may occur in combination with an interruption of the conductors.

Again, supposing a fault has been located by ordinary methods and upon opening a trench to effect the repair, the engineer is confronted with several cables without any indication of the faulty one. By using the pick-up device on each in turn (without cutting any cable) a signal sent from the end of the faulty cable will enable the faulty cable to be identified.

The apparatus also permits rapid determination of the depth of a conductor. The measurements are simple and do not require skilled operators. A direct indication of the depth is obtained independently of the type of soil, even on river cables. Another use for the instrument is in tracing pipe lines buried in the ground, or concealed in buildings, and of detecting breaks and major leaks in such lines.

The instrument comprises two detector coils, a valve amplifier, a crystal headset and battery, all housed in a portable case. The weight of the complete equipment is less than 12 lb, but an additional source of a.c. or pulsating d.c. has to be provided at one of the terminals of the cable under test. This source is connected between one conductor of the cable and earth, or between two conductors. It normally consists of a battery and interrupter. In special cases an alternator or oscillator may be employed, or the cable may be connected to a.c. mains through a protective condenser, or the like.

The directivity obtainable makes it possible to determine the orientation of a current carrying conductor within 1 or 2 degrees.

The instrument is carried by a shoulder strap, and the controls are protected by a lid which is normally closed. The dimensions are 12in by 13in by 6in overall. Separate compartments are provided for the various accessory parts and access is obtained to the battery and detector compartments by lifting small hinged lids.

The detectors have laminated iron cores and are connected to the amplifier via the depth determination circuit, using screened leads, plugs and sockets. Both detectors are housed in the lower portion of the case, nearest the cable or pipe under test; if desired, they may be withdrawn by opening a door in the side of the csae. Non-reversible plugs ensure correct phasing of the windings.

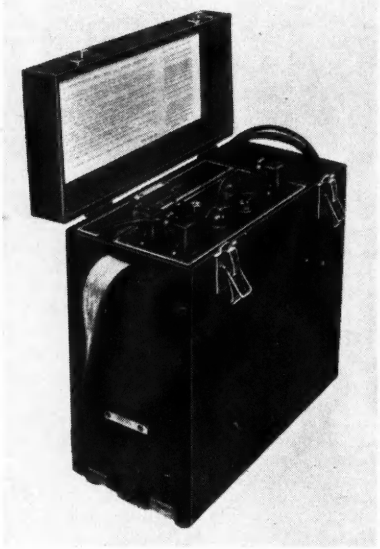
The detectors are completely shielded electrostatically; this, in conjunction with the use of piezo-electric headphones of high impedance, allows stable operation at an unusually high sensitivity.

The depth circuit comprises a selector switch and calibrated potentiometer. With

the selector set to "Fault," the detector windings are connected electrically aiding, affording maximum sensitivity for tracing cables, pipes and faults.

For depth measurement, or obtaining a differential indication of the position of a fault, the selector switch is turned to "Depth," when the windings are connected electrically opposing. The potentiometer serves for the measurement of depth. When measurement of depth is not required and reduced sensitivity is permissible, only a single detector need be carried. The selector switch in this case should be set to "Single."

The amplifier employs three miniature pentodes and is R-C coupled throughout for



Improved "Addison" cable fault finder

maximum gain at least battery consumption. All three valves are of the same type to facilitate the stocking of spares.

Miniature multi-way sockets are provided on the front panel of the instrument for the input and output connections. A pilot light indicates when the set is in operation to guard against its being left switched on accidentally when not in use.

A second selector switch on the front panel enables a sharply tuned circuit to be inserted, tuning the amplifier to 1,000 c/s for discrimination between wanted sound and interfering noises when the apparatus is used alongside other conductors carrying a.c. A suitable source must be employed in this case.

Maximum gain is obtained with the selector switch in the "Linear" position, when no discrimination is provided; a third position serves to switch the instrument off when not in use. The front panel also carries a volume control.

The headset consists of two piezo-electric receivers held by a head-band. Owing to the high impedance of this type of earpiece the output stage may be R-C coupled without loss of amplification. The tendency to feed back due to stray coupling between the detector coils and the headset has been reduced to allow stable operation at very high sensitivity. An appreciable saving in weight is also effected by the use of non-magnetic types of headphones and the elimination of the output transformer.

An "Ever Ready" type B.114 combined battery serves both the filament and anode circuits. The total anode drain for the three valves does not exceed 0.5 mA, and the circuit will tolerate a filament voltage drop to as low a value as 0.8 V without measurable reduction of amplifier sensitivity.

If desired, separate batteries may be employed and provision has been made for the use of dry or jelly acid accumulators (Varley type VPT7/9 and Exide type MR2A, respectively) to fit into the battery compartment. The removal of a strap in the amplifier ensures that the valve heaters are fed at the correct voltage.

"Trader Year Book"

THE contents of the 1949 edition of "The Wireless and Electrical Trader Year Book" have been revised and extended to make it of more practical day-to-day help to all engaged in radio, television and domestic electrical manufacture and marketing than any previous edition. For service engineers in particular there is an entirely new section devoted to valve-base connections. Current valves and cathode-ray tubes are listed in convenient tables, and the base connections may be seen at a glance. In the directory section names, addresses, telephone numbers and products of the firms engaged in the radio and electrical industries have been brought up to date. The Trader Year Book will also prove of great assistance to overseas firms who are seeking contact with British suppliers. This edition (266 pp.) is quarter bound in brown cloth. The directory sections are printed on distinctively tinted papers for ease of reference. It is published at 10s 6d post free by the Trader Publishing Co., Ltd., Dorset House, Stamford Street, London, S.E.1.

"Civils" Conversazione

AT the annual conversazione of the Institution of Civil Engineers which was held in London last week there was the customary exhibition of engineering models and scientific apparatus. Among the items of electrical interest was a device from the E.R.A. for securing and retaining magnetic records of any transient event. This can also "recollect" any change of conditions during a short period immediately before the event, without the need for providing lengthy continuously moving tape. The device shown secures and stores records of eight different simultaneous or non-simultaneous events, and with appropriate but simple modification could be arranged to deal with fifty or more. It embodies a play-back arrangement so that the magnetic records can be observed on an oscilloscope screen and subsequently photographed.

Phosphorescent and fluorescent materials were shown by the Research Laboratory of the G.E.C., with a demonstration of cold pressure welding, which is a technique of welding by pressure only, at room temperature, the joint being of wrought structure as opposed to a cast structure obtained by other means. This method has been used experimentally to sheath telephone cables with aluminium and appears to be quite satisfactory.

A model bridge was shown by the N.P.L. to illustrate the application of electrical resistance strain gauges to a structure. The gauges were fixed to eight tie-bars of the bridge, and meters indicated the variation of load as a locomotive passed over it. Although the tie-bars were all of the same size, the loads indicated were unequal, showing that some of the members were unnecessarily strong and heavy. Among other models was one representing the Ipswich base-load power station at Cliff Quay and a planning model of the projected semi-outdoor station for Larnaca, Cyprus.

Education and Training

A REPORT on the education and training of technologists has recently been prepared by a Study Group of the Federation of British Industries Industrial Research and Education Committees. It states that an increasing effectiveness in the translation of scientific discovery to industrial operations is widely recognized, and industry has frequently expressed the view that much could be done to meet this need by improving educational courses and the more appropriate training at graduate level of those about to enter upon an industrial career.

The report, which has been approved by the F.B.I. Grand Council, recommends that, wherever possible, courses of study should comprise at least three years post-intermediate of which two should be devoted to fundamental science and one to the appropriate applied science. It is recommended that more university students should complete a full three-years post-intermediate degree course in fundamental science and devote a fourth post-graduate year to specialized study. This fourth year, wherever possible, should be deferred until after a period of industrial training. Greater attention should also be given at school and college to the need for lucid exposition in the written and spoken word.

It is further recommended that provision be made to enable the standard of teaching and curricula of technical colleges to be raised, and that qualifications in technology should be of two kinds: (i) general degrees in technology at the graduate level and (ii) a master of technology degree should be awarded to those with bachelor degrees taking a fourth year in technological subjects. Degrees should remain open to external students, and graduates should be able to achieve higher external degrees on the basis of research work.

X-Ray Protection

THE increasing use of high energy X-rays in medical diagnosis and treatment has presented new problems in all phases of radiation protection and shielding. Recommended standards for the installation and use of high-voltage X-ray equipment are concisely set forth in a 49-page booklet, "Medical X-ray Protection up to Two Million Volts" (Handbook 41), which has just been published by the American National Bureau of Standards. It contains instructions for meeting present accepted standards as well as advisory recommendations that should be applied wherever possible. Rules are also given for working conditions, survey and inspection of installations, planning an X-ray installation, structural details of protective barriers and specific types of installations.

A chapter on electrical protection deals with such topics as high-voltage circuits, earthing inspection and maintenance, warnings and instructions, and first-aid and fire extinguishing devices. There are also tables and graphs for determining the requirements of protective barriers and distance protection in specific cases.

The book is obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., U.S.A., price 15 cents. Remittances from countries other than America must be in U.S. exchange and include an additional 5 cents to cover postage.

NEW BOOKS

Hydro-Electric Engineering. By Geoffrey Gerard, F.R.S.E., A.M.I.E.E. Pp. 181; figs. 101; index. Sir Isaac Pitman & Sons, Ltd., Parker Street, Kingsway, London, W.C.2. Price 20s.

Designed to meet the needs of practical engineers, this book deals with the civil, electrical and mechanical aspects of hydro-electric engineering in a clear and readable manner. It is well illustrated and contains a wealth of information relating to actual installations.

Commencing with a survey of the world's resources of water power, the author goes on to explain how they may be assessed in a particular area. Flow measurement and the use of rainfall figures are described in some detail, but the method of delineating a catchment area needs explanation. Subsequent chapters deal with the separate parts of high, low and medium head installations from the dam to the machines, transformers and switchgear. Of the 55 photographs included, most are clear and informative, but in some cases a good line diagram would have served the purpose better. There are a number of detailed sectional views of plant (some in the form of folding plans) conveying an idea of detail which would take too much space to describe. Four important installations are described as examples at the end of the book and a chapter is devoted to the possibilities of tidal power.

The electrical side of the subject is well covered in outline and the treatment is elementary enough to be understood without specialized electrical knowledge. A little more knowledge of hydraulic terms and practice seems to be assumed, but not enough to deter the purely electrical reader. The value of this informative work would be enhanced by the addition of a bibliography, for many aspects of the subject should provoke further reading in specialist literature.—J. A. C.

Fundamentals of Discharge Tube Circuits. By V. J. Francis, B.Sc., A.R.C.S., F.Inst.P., M.I.E.E. Pp. 134+x; figs. 40. Methuen & Co., Ltd., 36, Essex Street, London, W.C.2. Price 6s 6d net.

There is no doubt, as is stated in the preface of this book, that an understanding of the principles underlying discharge tube circuits is of rapidly growing importance to a great many electrical engineers. This is due to the rapidity with which discharge tubes are replacing tungsten filament lamps. The author will also have the agreement of many when he says that the subject is an unsatisfactory one on account of the complexity of the physical processes involved. This, however, only makes the book all the more welcome, for although the author does not spare his readers, no one who is prepared for the close and careful attention which the subject demands can fail to gain from these 130-odd pages of lucid exposition a much fuller understanding of discharge tube behaviour and of the way in which the various circuit components can be designed to give a satisfactory performance, often as the result of judicious compromise between conflicting requirements.

Although the greater part of the book is concerned, as the title indicates, with fundamentals, the final chapter deals in a very practical manner with the design of circuits for discharge lamps and gives a number of important details of typical lamps.—J. W. T. W.

Electrische Messung Mechanischer Grössen. By P. M. Pflier. (Third edition). Pp. 256+vi; figs. 308; index. Springer Verlag, Berlin. Price 30 DM.

This German book, of which the first edition appeared in 1940, is devoted to the use of electrical methods for the measurement of mechanical magnitudes, a subject of rapidly increasing importance at the present time. Circumstances have compelled the author to concentrate on the German approach to these problems, and most of the applications described are pre-war. This, combined with the existence of a smaller but excellent American book by Roberts, makes the present publication less interesting to the English reader. However, the numerous descriptions of instruments which have actually been built are still welcome to the worker in this field.—A. B.

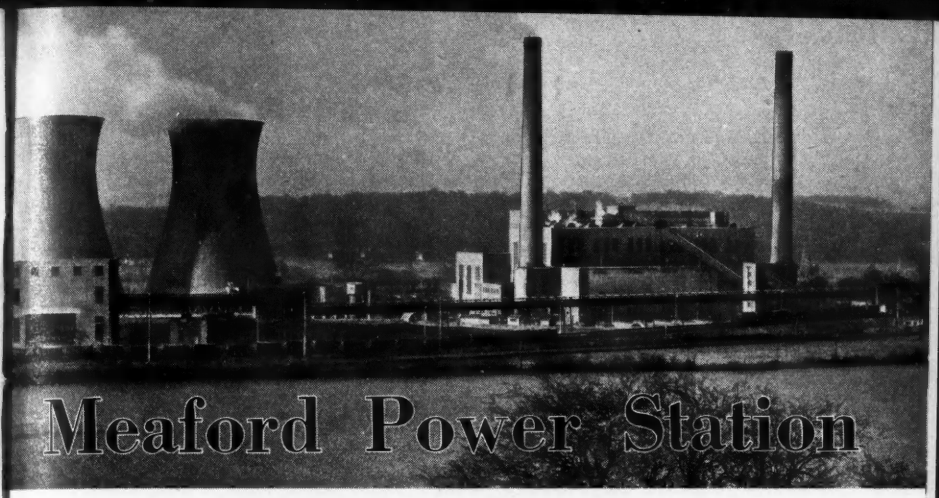
Odhams Motor Manual. Pp. 320; figs. and index. Odhams Press, Ltd., Long Acre, London, W.C.2. Price 9s 6d.

This practical book on the care and maintenance of modern automobiles includes an excellent chapter on electrical equipment.

Books Received

Radio-Frequency Heating. By L. Hartshorn, D.Sc., A.M.I.E.E. Pp. 237; figs. and index. George Allen & Unwin, Ltd., Ruskin House, Museum Street, London, W.C.1. Price 21s.

Sound Film Projection. By F. W. Campbell and others. (3rd edition). Pp. 260; figs. and index. George Newnes, Ltd., Tower House, Southampton Street, Strand, London, W.C.2. Price 21s.



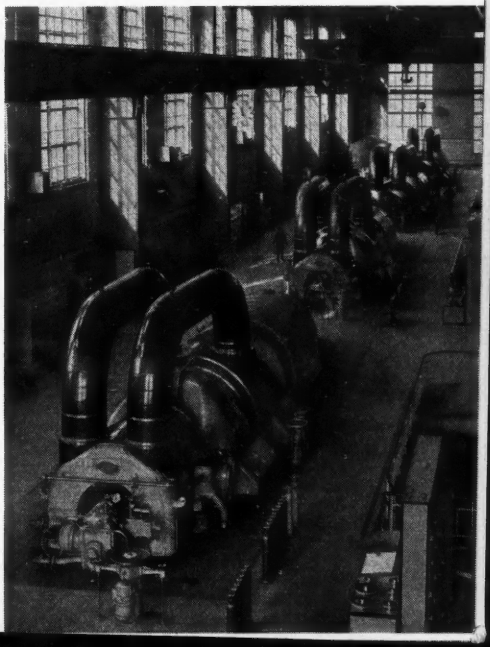
Meaford Power Station

AN OPERATIONAL DESCRIPTION

It will be recalled that after the war we decided to describe in two stages—constructional and operational—the country's future power stations. The new Meaford station of the Midlands Division of the British Electricity Authority is now in full commission, and most of its plant has passed the "teething" stage; so we present this first operational description.

Meaford was also the subject of our first constructional description (31st January, 1947, issue) when the station was owned by the North West Midlands Joint Electricity Authority. This 120,000 kW station, with its four 30,000 kW G.E.C. turbo-alternators and six Babcock & Wilcox 240,000 lb/hr boilers, is the first of two stations to be constructed at Meaford, a convenient point in the gap between Birmingham and Manchester previously without any main generating station. Its very close proximity to coalfields—indeed it is on one of these—was another important factor in the selection of the site, and in this connection it is of particular interest that while the second station of 240 MW is being built the National Coal Board will be constructing a new pit which will be situated between the two power stations. The coal consumption of both stations will be about a million tons per year, and it is probable that the complete production of slacks from this colliery will be delivered direct to the bunkers of both the generating stations.

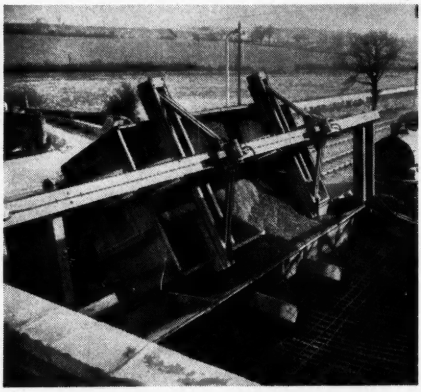
The new station is supplying the grid direct. It is unusual in that it has been completed to its full capacity right from the start, allowance being made for the progressive commissioning of the plant. Although the commissioning programme was a few months later than was anticipated when we published the constructional article, it was a good achievement to commission all four sets in 1948. And the results of the operation for that year are encouraging: kWh generated, 537 million; kWh sent out, 505 million; coal consumed, 261,700 tons; lb of coal per



Meaford "A," shown in our title picture, is the first of two stations to be erected at this site. Our picture on the right shows the complete four sets, all of which were commissioned in 1948

kWh sent out, 1.16; per cent make-up, 1.7; turbine steam consumption per kWh generated, 9.36 lb.

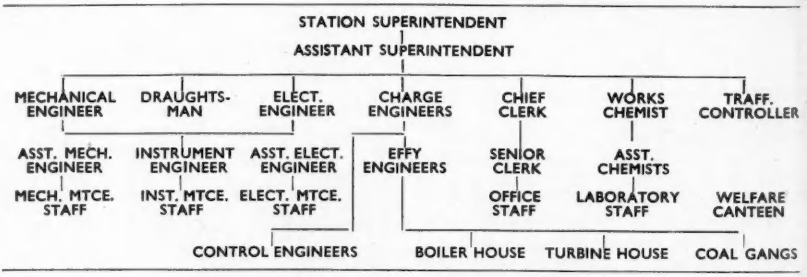
The steam conditions are 650 lb/sq in and 850 deg F at the superheater outlets, while those for the second station will be 1,500 lb/sq in and 1,050 deg F. Under the station superintendent, Mr. E. H. Taylor, and the assistant station superintendent, Mr. J. Barr, an efficient operational staff has been built up, and the success of this lies, to a considerable extent, in the local training of men prior to the commissioning of the station. A well appointed lecture room with screen and projector has latterly stood in good stead for such training work, and with this and the practical training afforded by the station itself the nucleus of a well-trained staff should be ready to tackle Meaford "B" before that station is commissioned.



Both the tippler wagon beam and the grid are fitted with vibrators

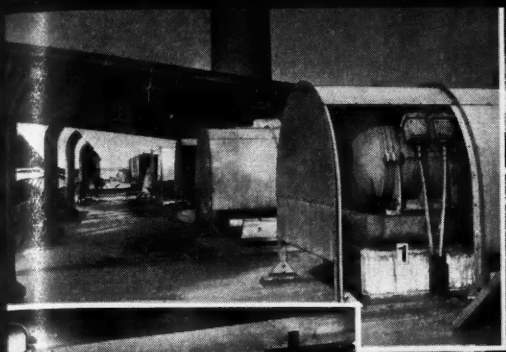
normal to the longitudinal axis of the boiler house and one at the radial point of the semi-circular 70,000 ton storage ground. In a building at each point is a 30 ton side-discharge wagon tippler — 20 tons load, 10 tons wagon. The washed Staffordshire slack has a tendency to clog, so that both the wagon tippler beam and the grid through which the coal is delivered are fitted with "Sinex" eccentric vibrators.

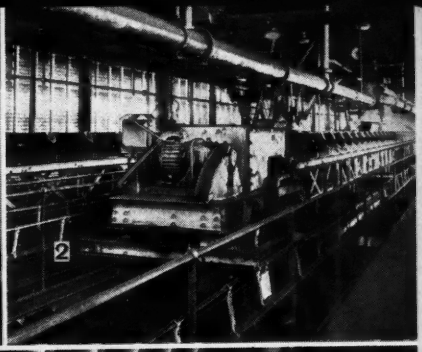
From the hopper under the grid at the first delivery point the coal is delivered by two inclined belt conveyors, via a junction tower where automatic sampling is effected, up to the conveyor house over the boiler house bunkers where it is chute fed on to two shuttle conveyors which serve at will any of the 18 bunkers, i.e., three per boiler. One bunker of each group of three is reserved exclusively for dry coal for starting-up purposes. At the second

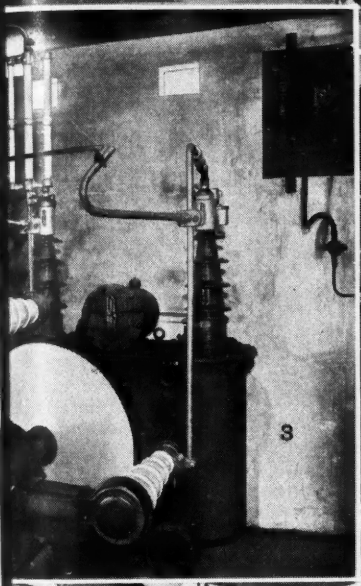


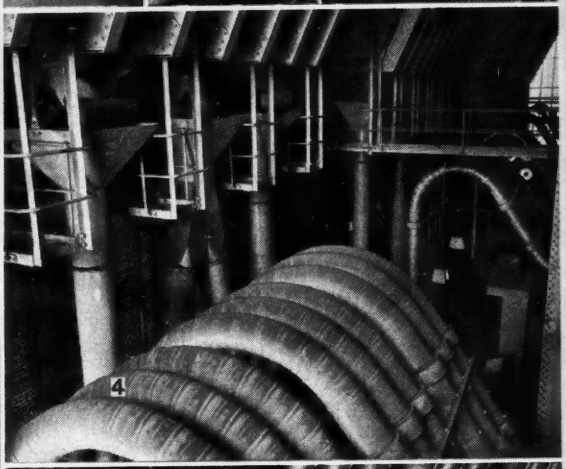
An efficient operating staff has been built up

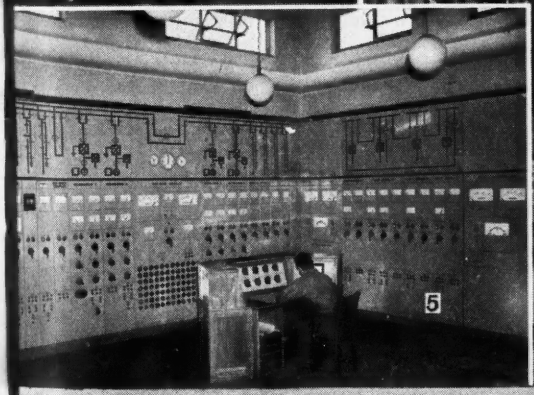
We are convinced that there is no truer example of the production flow line or a combination of lines than the modern power station, so we present our description accordingly. On the railway sidings there are two coal receiving points, one in line with the centre of the boiler house and delivery point the under-grid hopper serves two rectangular bucket elevator-conveyors which have a vertical lift of about 100ft and a horizontal travel at both the top and bottom of about 40ft. The top travel is on the top floor of a special building, and from these sections

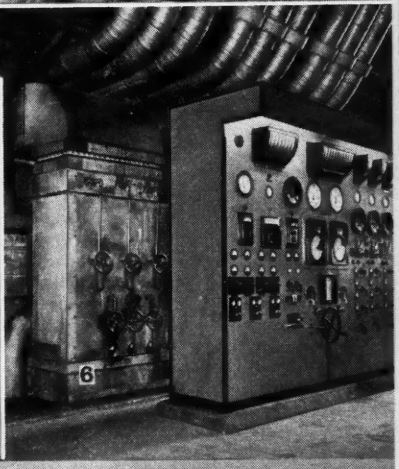






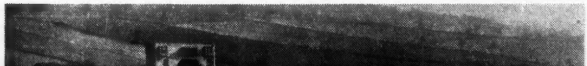






(1) Air is drawn initially from just under the boiler roof by two f.d. fans per boiler. (2) Shuttle conveyors serve at will any of the eighteen bunkers. (3) The electrostatic precipitator transformer provides up to 100,000 V via the disc rectifier. (4) From the bunkers the coal is fed immediately to the mills, and there are nine p.f. feeds per boiler (three mills). (5) In the attractive control room the switchgear control panel and system diagram are around the walls, and the stop valve and rheostat controls are at the central desk. (6) Each boiler is fully automatically controlled from its central control board at the firing floor

the incoming coal is chute fed down to a radial boom conveyor on the floor below. This radial conveyor discharges into an initial pile at ground level, and from this pile the coal is distributed over the storage ground by means of a drag-scraper which has its anchoring point at a ballasted pilot car somewhere on the



The coal is distributed by a drag-scraper; radial conveyor and tippler house on rear left

crescent track around the storage ground.

The car is electrically propelled and has an overhead trolley system, while the drag-scraper is winch driven, the winch having a 150 h.p. motor drive. Both the winch and the pilot car are controlled from the top floor of the building where special observation windows command a view of the whole storage ground. The drag-scraper system is also used for reclaiming, in which case the coal is brought to a grid at the foot of the building and, via a hopper beneath, is fed once again to the bucket elevator-conveyors. In this case, however, the coal is by-passed on the top of the elevator-conveyor to another chute which delivers the fuel on to another belt conveyor which transports it to the first delivery point from which the reclaimed coal is passed up to the boiler bunkers as previously described. The handling plant direct to the bunkers and that for dealing with the reclaimed coal each have a capacity of 150 tons/hr. The B. & W. coal-handling plant uses a Fraser & Chalmers drag-scraper.

From the bottoms of the coal bunkers the fuel is delivered directly by vertical pipes to the B. & W. 12-ball mills from which, after powdering, it is blown up in an air stream, to be referred to later, to the boiler burners, of which there are nine per boiler, i.e., three feeds from each 5 tons/hr mill. After combustion the ashes fall to the hopper bottoms of the combustion chambers and thence into a sluice system which discharges through a crusher into a sump from which the mixture of ash and water is pumped up through a pipe line to settling ponds on the hillside. Closely associated with the ash-handling, however, is the disposal of the grit extracted from the flue gases by electrostatic precipitation plant. This grit is drawn from the precipitator hoppers by vacuum on the aspirator principle, and is passed on to the ash-handling line for delivery to the settling ponds. Out of an average of 100 tons per day, representing a coal consumption of 1,000 tons, 65 tons is grit from the flue gases and 35 tons ash from the combustion chambers. The grit handling and ash handling are carried out as quite separate operations.

Air Flow Line

To deal with the air and flue-gas circuit, air at 100 deg F is initially drawn from just under the boiler-house roof by two f.d. fans per boiler. The f.d. fans are vane controlled for air quantity and driven by two-speed motors. The air from the f.d. fans passes through the main air heater, and 80 per cent of it goes forward as secondary air to the combustion chamber via annular spaces at the burners, and tertiary air via ports in the water-cooled walls. About 20 per cent of the air is bled from the main heater, however, by means of a primary-air fan and passed through the primary air heater on to the p.f. mills from which it is passed on with the powdered fuel to the boiler burners. The discharge tempera-

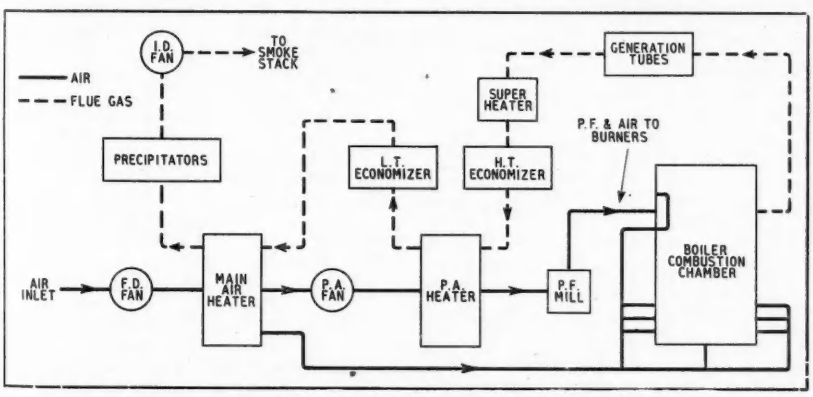
ture of the secondary and tertiary air (80 per cent) at the main air heater is 400 deg F. The discharge temperatures of the bled primary air (20 per cent) at the main air heater, the primary-air heater and the p.f. mills are 275, 250/500 and 150 deg F, respectively.

The products of combustion from the chamber pass over the generator tubes and superheater tubes, and thence, in turn, through the h.t. economizer, p.a. heater, l.t. economizer, main air heater and the precipitators from which they are drawn by the i.d. fans and finally discharged to the chimney. The discharge temperatures at the h.t. economizer and the main air heater are 875 and 290 deg F, respectively. We took the opportunity to see inside the rectifier chamber and the rapping-equipment room of one of the Lodge-Cotterell precipitators which was "down" for maintenance work. The normal electrode charging voltage is about 40,000, but the transformer provides for voltages up to 100,000 if required. The half-wave rectifier is of the synchronous-speed disc type, with the positive earthed.

Now for the major flow line, i.e., the feed-water and steam circuit or heat cycle. Steam from the boilers passes through the 23 stages of the h.p. cylinder of the turbine and then in two streams through the two six-stage sections of the l.p. cylinder from which it discharges at 0.75 lb/sq in and 92 deg F into the Hick Hargreaves twin condenser jackets. The extraction pump draws the condensate off and passes it on through the ejector jacket, drain coolers, gland heater and l.p. feed-water heater where the discharge at 180 deg F constitutes the boiler feed-pump suction. In addition to three stand-by turbo-driven feed-water pumps there are, all told, five 550 h.p., 3,000 V, 2,850 r.p.m. motor-driven feed pumps. At about 1,000 lb/sq in the pump passes the water on, in turn, through the i.p. heater, the evaporator heater and the h.p. heater, where the discharge temperature is about 350 deg F.

Return in Heat Cycle

At this temperature and approximately the feed pump discharge pressure, the water enters the l.t. economizer ready for recirculation through the boiler plant system during which the operating conditions are progressively restored to 650 lb/sq in and 850 deg F. The heating medium for the l.p. feed-water heater is steam bled from the turbine l.p. cylinder at 11 lb/sq in, while the i.p. heater, the evaporator heater and the h.p. heater are all served with steam bled from the turbine cylinder at pressures of 34, 90 and 185 lb/sq in, respectively. Make-up water for the circuit is obtained from the public water supply at Bury Bank, and it is first treated by the Kennicott lime-soda softening process. Finally the make-up is distilled in a unit evaporator on each turbo-alternator set. There is also a central evaporating plant which is used as



About 20 per cent is primary air and about 80 per cent secondary and tertiary air

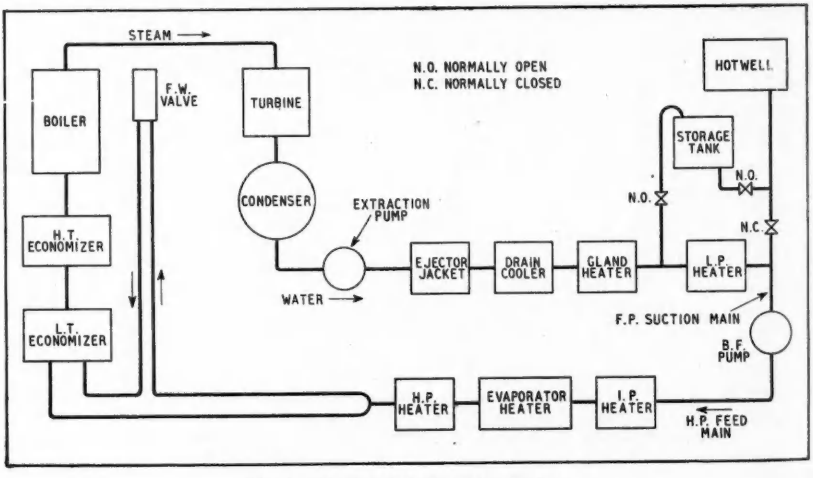
stand-by for the four unit evaporators.

From the operation viewpoint perhaps the most interesting point about the boiler plant is the fully automatic control of the steam pressure by the Bailey system. With the steam flow meter on each boiler is installed a pilot valve control which increases the flow of air as the steam pressure falls, and this air-flow increase results in an increase in the supply of fuel to the mills, with the overall result of an increase in the steam output. If the steam pressure rises this procedure is reversed, the air supply being reduced as is the amount of fuel to the mills. On a giant instrument panel mounted centrally overhead across the boiler house firing floor is a critical pressure gauge which has graduations of 1 lb/sq in for each of the 5 lb above and 5 lb below the normal operating pressure of 650 lb/sq in. Each boiler is automatically controlled from its own central panel at the firing floor level, and the control operations follow the variations in load. It is possible, however, to select any one boiler as the master for automatically controlling the complete boiler installation.

lated through the condensers by five Allen centrifugal pumps in a pump house adjacent to the two Davenport hyperbolic cooling towers, each of which will reduce the temperature of three million gallons of water per hour from 82.5 deg F to 70 deg F at economic load. The circulating water discharged from the condensers is used for the sluice ash-handling system, and from the ash ponds it is allowed to flow back to the River Trent via aqueducts and a pipe line. The sewage effluent has a pH value of 7.5, while its total hardness varies from 250 to 500 parts per million, according to the season. About half of this hardness, however, is temporary in character.

The Electrical End

At the delivery end of the flow-line system we are once again reminded of the comparative smallness of the electrical system, taking the power station as a whole. The part it plays, however, can be quite another matter according to the viewpoint. Each 3,000-r.p.m. alternator is a rotating-field machine with separate excitation, and is ventilated on the closed-

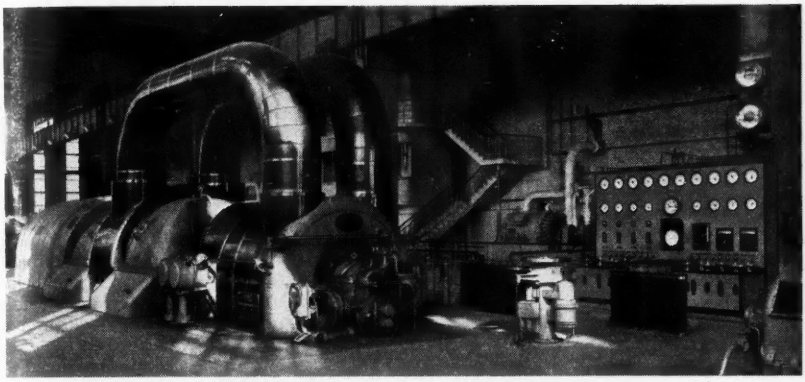


The closed heat cycle is the major flow line

Cooling water for the condensers is the effluent from the Stoke-on-Trent sewage works about 1½ miles away. The sewage water is pumped into the cooling-tower ponds from which it is lifted and circu-

air-circuit principle with water-cooled cooling air. The normal air and water consumptions are about 55,000 cu ft/min and 570 gal/min at 70 deg F. The generating voltage is 11,800, and via a

G.E.C. metalclad drop-down vertical circuit breaker, in each case separately housed with its isolating unit, each alternator supplies a 35,000 kVA step-up



Each turbo-alternator has most comprehensive instrumentation

11.8/132 kV transformer in the adjacent new grid substation.

From this station there are six outgoing feeders for direct transmission to the grid —three to Stoke, one to Stafford, one to Crewe, and an interconnector with the Ironbridge generating station. Each outgoing feeder is controlled by a 132 kV oil circuit breaker in the grid substation. The following protection systems serve the major electrical equipment: Merz Price against phase faults from the alternator star point up to and including the generator o.c.b.; an overcurrent back-up relay for the Merz Price system from and including the generator o.c.b. back to and including the alternator; an overcurrent relay for phase faults from the alternator circuit breaker down to the 3 kV current transformers on the 3 kV air circuit breaker controlling the supplies to the major auxiliaries; an overcurrent relay for phase faults from and including the 132 kV o.c.b. down to the Merz Price generator zone; an earth leakage relay from and including the 132 kV o.c.b.; in the event of a fault on the 132 kV busbar system busbar zone protection will trip the faulty section automatically.

The attractive main control room in the administration block is square and the switchgear control panels and system diagram are arranged round the room. The central control engineer's desk contains the controls for the four turbine governors and four field rheostats. There is excellent trough lighting for diffusion from the ceiling, and the room is air conditioned. An accommodation block is well appointed for all grades of the station operating staff. The main stores and a fitting shop are housed in a separate building adjoining the administrative block—a convenient arrangement for handling clerical records and issuing materials.

We are indebted to Mr. F. W. Lawton, Divisional Controller, Midlands Division, B.E.A., for permission to visit the station and publish this article, and to Messrs. Taylor and Barr for their assistance in compiling the article.

Rural Telephone Kiosks

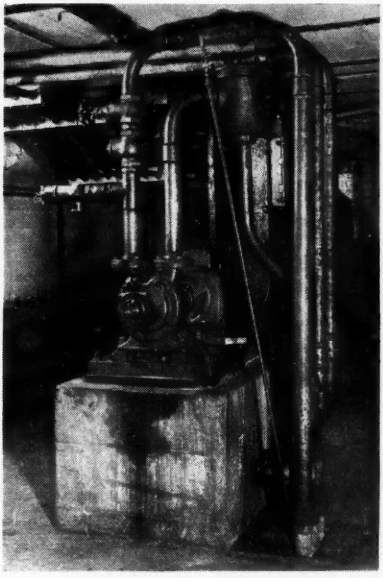
THE General Post Office is to provide 780 telephone kiosks in the ensuing twelve months in the rural areas of England and Wales in agreement with the Rural District Councils' Association for each of the administrative counties for which there is a County Branch of the Association. This is the first of a series of annual quotas. Each Rural District Council concerned is being asked to give the list of the places in its area where the kiosks are considered necessary. Kiosks provided on highways for passing motorists will be outside the scheme, and these will continue to be provided at the discretion of the telephone manager.

Pumping Equipment

PLANT ON LONDON'S UNDERGROUND RAILWAYS

BECAUSE such a large proportion of London Transport's underground railway system lies below the level of the main drainage system, special equipment is required to dispose of water, which for one reason or another accumulates at certain points, by pumping it into surface drains.

The number of pumps installed varies according to the circumstances. For example, at places where considerable sump capacity is available and the inflow such that pumping is required only at infrequent intervals, one pump only is normally sufficient. Where there is a regular but considerable inflow of water which might result in flooding and interruption to the train service, two pumps are required, one being a spare for use in emergency. In other situations, particularly in cuttings or at tunnel portals where the normal inflow may be suddenly increased to an abnormal extent by heavy rainfall, three pumps are provided, one for dealing with the normal flow, the second coming into action when the flow is abnormal, the third being available if either of the other two becomes inoperative.



Pumping equipment in the lower escalator chamber of a tube station

Where it is necessary the pumping equipment is provided with alternative electricity supplies so that regular pumping is unaffected by interruption of the normal supply. Some 300 electrically driven pumps are required, singly or in groups of two or three as detailed above, to deal with the inflow of water to the rail system. Whenever possible they are arranged for automatic operation, being controlled by the level of the water in the sump. Such equipment requires little attention, apart from regular inspection. In many cases the sumps are furnished with an alarm float, which operates a bell or warning light in the nearest signal box or station if the water level rises to an abnormal height.

The total amount of water pumped out of the underground system every day is about 2.5 million gallons, most of which is from the sub-surface lines. Tube lines are not subject so much to the inflow of water as they are unaffected by rainfall, except where they emerge into the open. While in most tube stations the amount of water to be disposed of is not great, it may accumulate in one or more sumps at different parts of the station. One pump is sufficient to deal with this, but automatic operation is not practicable as more than one sump is involved. Pumping is therefore controlled by a member of the staff who visits the station regularly for this purpose. In all modern stations such pumps are situated in the lower escalator chamber.

In addition to fixed pumping plants, many portable pumps are available to deal with an unforeseen accumulation of water on the system. Portable electrical generators are also available both for use in the event of a current failure or to supply portable pumps in an emergency.

PERSONAL and SOCIAL

News of Men and Women of the Industry

A PRESENTATION to **Mr. J. W. C. Milligan,** B.Sc., M.I.E.E., manager, Stafford Works English Electric Co., on his appointment as general manager of the Brush Electrical Engineering Co., Ltd., was recently made by Sir George Nelson, chairman and managing director of the English Electric Co. Mr. J. Rogers, general manager of works, presided. Sir George Nelson gave a brief sketch of Mr. Milligan's career during his 25 years with

Sir George Nelson making the presentation to Mr. J. W. C. Milligan

the company. After graduating at Glasgow University he started as an apprentice at the Dick, Kerr Works, Preston, in 1924 and went to Stafford in 1926. Towards the end of 1930 he was selected to go to the United States as the first resident representative of the English Electric Co. with the Westinghouse Electric Manufacturing Co. When he returned to England he was appointed deputy to the manager of the Stafford Works, and in 1944 manager. Mr. Milligan had taken an active part in the public and social life of Stafford. Sir George then presented a silver tray to Mr. Milligan, and a sapphire brooch to Mrs. Milligan, and a leather travelling case to each. Mr. Milligan made a brief speech of thanks.

Miss Elizabeth Gwillim, senior housecraft adviser to the Dumfries and Galloway Sub-Area of the South-West Scotland Electricity Board, has been awarded a Caroline Haslett Trust Travelling Exhibition tenable in Holland in September and October of this year. Miss Gwillim will study electrical development in Holland and will make a special study of electricity in rural areas.

Mr. F. E. Newton has been appointed to succeed **Mr. P. B. Hall** as representative of Newton Brothers (Derby), Ltd., in the Manchester and North Western Area, covering Lancashire, Cheshire, West Riding, Westmorland and North Wales.

Concrete Utilities, Ltd., have appointed **Mr. C. V. L. Marques** works director and **Mr. E. Russ** sales director.

There was a record entry for the annual competition for the Ferranti Transatlantic Golf Trophy, presented by Sir Vincent de Ferranti, which is played for by members of the staff at the company's four factories at Hollinwood, Moston, Edinburgh and Canada. **Mr. D. D. Rydings** (Hollinwood) was this year's winner.

Mr. J. W. Lapthorn, manager of the Order Department of W. T. Henley's Telegraph Works Co., has been presented by Sir Montague Hughman, on behalf of the company, with Savings Certificates and a framed copy of a resolution of the board, in recognition of his fifty years' service with the company.

Mr. W. E. Arnold, A.M.I.E.E., A.M.I.P.E., M.I.I.A., who for the past four years has been general manager of Watliff Co., Ltd., of South Wimbledon, S.W.19, has now been appointed managing director. Mr. Arnold was educated at the Imperial College of Science and Technology, City & Guilds (Engineering) College, South Kensington, and has been actively engaged in industrial management for many years. He has recently been invited to become a founder of the British Institute of Management.

Mr. W. E. Arnold

Mr. O. V. S. Bulleid, C.B.E., M.I. Mech.E., has been elected president of the Institute of Welding for the year 1949/50, with **Mr. C. S. Milne** as vice-president. Mr. Bulleid, who is about to retire from his present post as chief mechanical engineer, British Railways, Southern Region, has been appointed consulting mechanical engineer to Coras Iompair Eireann (Irish

Transport Company). Mr. Milne is founder and head of the firm of C. S. Milne & Co., Ltd., Deptford.

Mr. T. Young, O.B.E., A.M.I.E.E., Assoc.I.Mech.E., has resigned from his position with Courtaulds, Ltd., to take up an appointment with the War Office as chief electrical engineer at Catterick Camp.

At the annual meeting of the Resistance Welding Machine Manufacturers' Section of B.E.A.M.A., **Mr. R. W. Ayers** (managing director, Sciaky Electric Welding Machines, Ltd.), was elected chairman for 1949/50, **Mr. F. Simmons** (British Federal Welder & Machine Co., Ltd., Dudley, Worcs.) deputy chairman, and **Mr. E. S. Waddington** (Philips Industrial, Ltd., London) vice-chairman.

Councillor C. M. Newton, Northampton, has been appointed an additional member of the East Midlands Electricity Consultative Council.

On Tuesday the Council of B.E.A.M.A. gave a luncheon at the Savoy Hotel, London, arranged by the export director, Mr. D. M. Buist, at which the guests of honour were **Mr. R. H. Saunders,** chairman of the Hydro-Electric Power Commission of Ontario; **Mr. R. L. Hearn,** general manager and chief engineer; and **Mr. R. E. Argersinger,** of Stone & Webster, U.S.A., consultants. Sir George Nelson, vice-president of B.E.A.M.A., presided, and about 45 members and guests were present, the latter also including Mr. J. S. P. Armstrong, Agent General for Ontario; Sir Graham Cunningham, chairman of the Dollar Exports Board; Sir Harry Gilpin, leader of the U.K. Engineering Mission to Canada; Mr. H. Oldham, U.K. Trade Commissioner, Toronto; Sir John Hacking, vice-chairman, B.E.A.; Mr. J. R. Beard, of Merz & McLellan; and Mr. H. Hobson, consulting engineer.

In welcoming the guests Sir George Nelson said that the British heavy electrical industry was anxious to adapt itself to Canadian requirements. Mr. Saunders, in the course of his reply, expressed his appreciation of the prices and prompt delivery of equipment by the English Electric Co. and C. A. Parsons & Co. in particular. He stressed the fact that plant considered suitable for other Dominions was not necessarily the kind needed by Canada.

Mr. K. Coombs, A.M.I.E.E., A.M.I. Mech.E., deputy municipal electrical engineer and transport manager at Penang, is retiring early this month and is going to live in South Africa. Mr. Coombs served his apprenticeship in the Electrical Departments of Malta and Chatham Dockyards and from 1915 to 1921 was in charge of the electrical test room at Chatham Dockyard. After being attached to the Naval Yard at Hong Kong for a short period he then went to Malaya as workshop and meter superintendent in the Electrical Department, Penang, and was appointed to his present position in 1946.

Mr. K. Coombs

In the note on Mr. L. H. Carmalt's appointment with the Simplex Electric Co., Ltd., in last week's issue, it should have been stated that after serving his apprenticeship he joined the Industrial Heating and Cooking Department of the G.E.C. (not Simplex) and remained with the G.E.C. until 25th May last, when he took up his appointment with the Simplex Co.

At the luncheon to visitors from the Ontario Hydro-Electric Power Commission

Mr. **Norman Dennes,** general manager for Harcourts, Ltd., Hereford, retired last week after 27 years' service with the company in Birmingham and Hereford. He was presented by the staff with a radio set and a wrist watch.

Mr. **S. Dickinson,** Associate I.E.E., whose election as president of the Electrical Contractors' Association is reported elsewhere in this issue, was born at Wigan in 1898. He was apprenticed to a Manchester firm of electrical contractors and attended technical school evening classes. During the 1914-18 war he served in the Royal Marines and afterwards was a supervising engineer. He stared up on his own account in 1924 and his present company was registered in 1931. Mr. Dickinson has been a member of the E.C.A. since 1928 and a member of the Council since 1937. In 1938-40 he was chairman of the Manchester branch and he was elected a vice-president of the Association last year.

Mr. S. Dickinson

Following the annual general meeting of the Gauge and Tool Makers' Association on 29th June, **Mr. F. W. Halliwell,** M.I.Mech.E., M.I.P.E., was re-elected president; **Mr. H. S. Holden,** chairman; **Mr. A. L. Dennison,** M.I.P.E., vice-chairman; and **Mr. R. Kirchner,** M.I.P.E., A.M.I.Mech.E., hon. treasurer.

Mr. E. M. Deloraine, a director and a vice-chairman of Standard Telecommunication Laboratories, Ltd., London, has recently received the degree of Doctor of Engineering (Ingénieur Docteur) of the University of Paris.

On 10th June the staff of the **General Electric Co.'s** Plymouth branch celebrated the twenty-first anniversary of the foundation of the branch. At a dinner held at the Grand Hotel, Mr. S. Hack, who has held the position of branch manager since the branch was first opened in 1928, took the chair. Mr. Leslie Gamage, vice-chairman and joint managing director of the company, who was accompanied by the Hon. Mrs. Leslie Gamage, congratulated the staff on their past achievements and wished them wel in the future. To commemorate the occasion Mr. Hack was presented with a gold-mounted pen and pencil with the good wishes of his staff.

A happy gathering took place recently at the Old Ship Hotel, Brighton, to celebrate the completion of fifty years' service with the General Electric Co., Ltd., by **Mr. W. P. Morgan,** manager of the company's Brighton depot. Thirty friends took the opportunity of wishing him well in his retirement on pension which has now taken effect Mr. F. Winstanley, a director of the company, presented him with a cheque, and Mr. F. G. Knight handed him a pipe and an electric clock on behalf of the Brighton staff.

A party of about 450, made up by the employees of **McKechnie Brothers, Ltd.,** and their wives and families spent an enjoyable day at Wicksteed Park, Kettering, on June 25th. After luncheon a cricket match was played between various works departments, other members of the party spending the afternoon either on the hard tennis courts, putting greens or on the lake.

Obituary

Professor R. Mesny.—We are informed of the death, on 8th June, of Professor René Mesny, of l'Ecole Supérieure d'Electricité, Paris. who was a close collaborator with Général Ferrié the celebrated French radio scientist, was a specialist in radiogoniometry, and the author of a number of works including "Cours de Radioélectricité Générale."

Mr. E. L. Coles, joint managing director of Felix Bateman, Ltd., lighting trade wholesalers, Birmingham, died on 23rd June after a short illness. He joined the company in 1919, became a director in 1932, and was appointed joint managing director in 1945. He leaves a widow and son.

Wills

Sir Archibald Page, chairman of the Central Electricity Board, 1935-44, who died on 7th March last, left personal estate in England and Scotland valued at £32,614.

Mr. C. A. F. Partridge, at one time associated with Partridge, Wilson, electrical manufacturers, Leicester, left £19,643 gross (£10,825 net).

Mr. J. W. Garsden, manager of the Manchester branch of the Edison Swan Electric Co., Ltd., left £11,463 gross (£11,166 net).

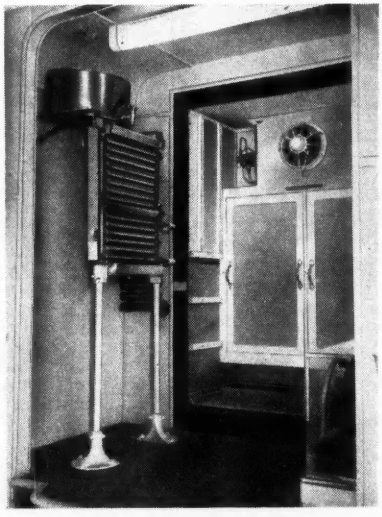
Mr. Marcus Macdonald, A.M.I.E.E., late electrical assistant to the chief mechanical engineer of the Great Western Railway, formerly with Belliss & Morcom, Ltd., and the General Electric Co., Ltd., left £4,016 gross (£3,779 net).

Mr. A. W. Money, A.M.I.E.E., late borough electrical engineer of Brentford and Chiswick, who died on 12th November last, left £4,103 gross (£4,037 net).

The Royal Show

COMPREHENSIVE ELECTRICAL DISPLAY AT SHREWSBURY

NO function during the year provides such an excellent opportunity for seeing the latest developments in electro-farming as the Royal Show. This year's display, which opened at Shrewsbury on Tuesday and concludes to-day (Friday), is on an even more comprehensive scale than before, and covers the application of electricity to every branch of agriculture, horticulture, dairy, pig and poultry farming, as well as the domestic uses in the farmhouses.



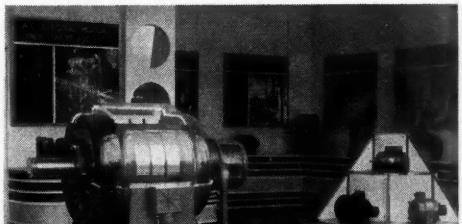
Interior of one of the "Prestcold" Showmobiles showing the water and direct expansion milk cooler and a sectional coldroom

The important part played by electricity on the modern farm is particularly emphasized by a display of appliances organized jointly by the Midlands Electricity Board and the British Electrical Development Association. In the dairy section the visitor is shown how electricity provides the most efficient and convenient method of milking cows, cooling and storing the milk, and providing hot water and steam for sterilizing utensils. The versatility of electricity is clearly demonstrated in the barn machinery section, where there is an example of a pneumatic grain blower, a hammer mill, a sack hoist, a mash mixer, a chaff cutter, a root cutter and a potato sorter. Most of the appliances can be seen in operation, and in addition there are scale models of the larger electrical appliances such as grain and grass dryers.

Every farmer knows how important it is to have an adequate supply of water, and the pumping section shows how easily this can be arranged when electricity is available. Of interest to the progressive poultry-keeper are an egg-laying battery with motor-driven cleaner and feeding troughs, incubators, brooders and hovers, and a poultry plucker. To illustrate to the market gardener and horticulturist the benefits of artificial heat an electrically heated frame, a soil sterilizer, a tomato ripener, cloches, etc., are shown. There is a small display of electric soldering irons, drills, grinders, welders and other workshop appliances.

The farmer's wife has not been forgotten, and there is a good array of cookers, water-heaters, fires, irons, vacuum cleaners, refrigerators and other appliances, which show how electricity is bringing the amenities of the town to the country dweller. A selection of modern lighting fittings reminds the farmer of the benefits of electric lighting in the dairy, the barn and in and around the farmhouse.

A further representative selection of electrical equipment is to be found on the stand arranged by the National Electrical Contractors' Trading Association, Ltd., in conjunction with the Electrical Contractors' Asso-



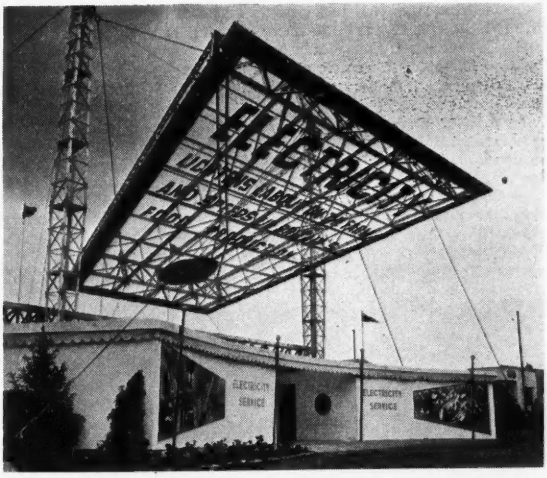
Sectional demonstration motor on the Brook stand with (on the rig t) standard protected and totally enclosed surface cooled motors and resilient mounted "Cub" motors for refrigerator duty

ciation. In the centre of the grass forecourt to the stand is a fountain pumped by electricity, with a 20ft clock tower bearing the insignia of N.E.C.T.A. and E.C.A. dominating the scene. Included in the exhibits are working examples of electrically operated equipment, and demonstrations of the practical application of electricity on the farm, in the greenhouse and in the home are being given.

Among the display of dairy equipment are milking machines, a churn immersion milk cooler, a bottle washer, steam raisers, sterilizing outfits, a bottle-filling machine, water heaters, a chilled water cooling unit and churns. Barn machinery includes a portable motor, a hammer mill, a moisture meter, a hoist, a grain grader and sheep shearers. A photograph shows a grass dryer.

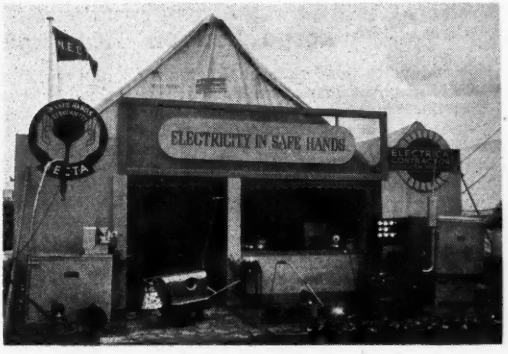
Incubators, a brooder, and an egg tester represent poultry farming equipment, while among miscellaneous equipment are a cake and fruit mixer, a dehorning tool, an animal coaxer, a diesel generating set, and a branding iron.

For the horticulturist, interest centres round soil-heating equipment, fencing equipment, a hedge trimmer and a mower. Special displays are given of farm lighting and water supply equipment, and, apart from manufacturers' exhibits, is a display of farmhouse appliances arranged by local members of the E.C.A., making a special feature of such home comforts and labour-saving machines as cookers, washing machines, boilers, dish washers, fans, refrigerators, vacuum cleaners, television sets and domestic heaters of various kinds.



Exterior of M.E.B.-E.D.A. stand

The G.E.C. stand



One end of the N.E.C.T.A. stand

On the stands of individual manufacturers also, plant for the dairy farmer is especially conspicuous. A display by the Perkins Clean Milk Equipment Co. is particularly comprehensive. The "Electrobloc" combined flash steam raiser and water heater for recorder milking plants is to be seen on J. W. Woolley & Co.'s stand. Incubators, brooders, hovers, mash mixers, egg transferring and testing tables indicate some of the ways in which electricity can serve the poultry farmer. A new dehorner is shown by the Cooper Stewart Engineering Co., which also demonstrates horse and cattle clipping machines, animal scarers and electric fences. Besides fenders, clippers and shearers, and milk coolers, the Wolseley Sheep Shearing Co. have an electric bucket heater.

All-electric grain dryer (R. Wells Agricultural Group)

The General Electric Co., Ltd., has a display drawing special attention to the latest sterilizing chests, boilers, soil heating equipment, barn hay-drying fans, rope hoists, farrowing heaters, egg tester, lighting equipment and various domestic appliances. Industrial vacuum cleaning plant, sack cleaners and time recorders are shown by the British Vacuum Cleaner & Engineering Co., Ltd.

A novel display by Pressed Steel comprises a fleet of "Showmobile" mobile exhibitions. These travelling showrooms, when opened, reveal a complete range of refrigeration equipment, including a new churn immersion cooler, a sectional cold room, a soft ice cream counter freezer, ice cream conservators, frozen food cabinets and domestic refrigerators. Among the many other companies showing refrigerators are the Essex Refrigerator Co., J. and E. Hall, Frigidaire and Boulton and Paul.

Considerable interest is being attracted by a 15cwt an hour portable all-electric grain dryer for the small farmer shown by the R. Wells Agricultural Group. It incorporates three fans, two of which are each fitted with 20 kW elements. A 4 per cent extraction is normally obtained, the complete apparatus costing £500. A moisture-in-grain meter is shown by Marconi Instruments.

Generating sets are much in evidence as well as pumps, elevators, etc. Welding equipment is shown by Philips Electrical and Murex. On the Brook stand motors between 0.25 and 200 h.p. include protected and totally enclosed surface cooled types for driving root cutters, grinding mills, corn kibblers, threshing machines and pumps; and smaller motors for churns, separators, bottling and refrigerating plant, and "Cub" fractional h.p. motors. Control gear is also represented.

Large quantities of Crompton paper-insulated underground cable have been supplied for use in the Show.

Large London Transport Plan

ON Monday, in the House of Commons, the Minister of Transport, Mr. Barnes, said that the report was being published on 5th July of the Working Party set up by the British Transport Commission to review the proposals of the Railway (London Plan) Committee. The estimated expenditure was of the order of £340 millions, and the works, which included many new tube and main line tunnels, would take some 20 or 30 years to complete. The proposals, if adopted, would exercise a determining influence on the planning of London, and the Government must give the fullest consideration to the report, and to the major policy issues affecting the planning of London, before decisions on the report could be reached.

Mr. Davies asked whether, in view of the high cost of these works and the fact that the Minister had not referred in his reply to any proposed electrification of any lines out of London, Mr. Barnes could give an assurance that the electrification of certain lines would take place before the heavy cost involved in constructing tube railways.

Mr. Barnes said that many of these electrification proposals were also involved, but the whole scheme would require very careful consideration, and he certainly could not give an indication of priorities at present.

COMMERCE and INDUSTRY

Electricity Supply Wages : Development of Inventions

THE National Joint Industrial Council for the Electricity Supply Industry met last week to consider progress made in the operation of the Wages Agreement of 31st May last. It was agreed that the District Joint Industrial Councils were dealing in the appropriate manner with the excess rates in accordance with the terms of the Agreement. It was decided to allow this machinery to continue in operation and the N.J.I.C. will consider agreements which are reached by the District Councils for local application of the Agreement. The N.J.I.C. also decided that, in order to avoid any delay and to expedite the approval of such agreements when received, an early interview should be sought jointly with the Minister of Fuel and Power to elucidate questions which may arise in regard to certain statutory provisions of the Electricity Act, 1947.

At meetings held this week the London power station men who had threatened to strike on Wednesday last decided to accede to the request of the president of the E.T.U. not to take "unofficial" action.

Broadcasting Inquiry

The Broadcasting Committee, under the chairmanship of Lord Beveridge, which is to consider the constitution, control, finance and other general aspects of the sound and television broadcasting services of the United Kingdom (excluding those aspects of the Overseas Services for which the B.B.C. is not responsible) and to advise on the conditions under which these services and wire broadcasting should be conducted after 31st December, 1951, held its first meeting on 24th June. The Committee will be glad to receive representations on any matters falling within its terms of reference. These should be sent in writing to the Secretary, Broadcasting Committee, General Post Office Headquarters, London, E.C.1, not later than 1st October, 1949.

National Research Development Corporation

The President of the Board of Trade, in accordance with the National Research Development Corporation Regulations, 1949, has appointed the following as members of the Corporation (which has been set up with effect from 28th June) : Sir Percy Mills, K.B.E. (chairman) ; the Earl of Halsbury, F.R.I.C., F.Inst.P. (managing director) ; Professor P. M. S. Blackett, F.R.S., M.A.; Sir John McLean Duncanson; Sir Edward H. Hodgson, K.B.E., C.B.; Mr. W. E. P. Johnson, A.F.C., C.P.A., A.F.R.Ae.S.; and Sir Edward de Stein.

The functions of the Corporation are defined as follows: (a) securing, where the public interest so requires, the development or exploitation of inventions resulting from public research, and of any other invention as to which it appears to the Corporation that it is not being developed or exploited or sufficiently developed or exploited; (b) acquiring, holding, disposing of and granting rights (whether gratuitously or for consideration) in connection with inventions resulting from public research and, where the public interest so requires, in connection with inventions resulting from other sources.

The Corporation has yet to appoint its staff and it may be some time before it is ready to get into full operation and deal with any great volume of work. Any correspondence should meanwhile be addressed to the National Research Development Corporation, I.C. House, Millbank, London, S.W.1 (Whitehall 5140).

Resistance Welding Machine Section

In reviewing the past year's activities of the industry at the annual meeting of the Resistance Welding Machine Manufacturers' Section of B.E.A.M.A., Mr. R. W. Ayers, chairman, said that expansion had continued in home and export sales, order books were extremely healthy, and the engineering industry was turning more to resistance welding as a process to cut manufacturing costs and improve production wherever metal products were fabricated. In common with other industries, they were finding that export selling was getting more difficult and, as an Association, they would need to give increasing attention to developing such trade.

The industry had been fortunate in that most of the shortages of raw materials which had occurred in former years had largely been overcome. Prices of some raw materials, notably copper, were also tending to fall in world markets, and the resistance welding industry would gain some advantage from this.

The British Electricity Authority gave its assent to the publication of the "Memorandum on Welding Load," which was distributed in the early part of 1949 to supply engineers at home and abroad, and many Area Boards had ordered quantities for distribution to their staffs.

With the increased interest of other tech-

nical and professional bodies in welding matters the Committee seldom needed to initiate specific programmes of technical or research work. Its function had become increasingly to appoint members to other committees, and to review their work and publications, so that the interests of members were protected. Arrangements of this nature left manufacturers free to concentrate on their direct interest of developing the wider use of resistance welding and selling more machines.

Atmospheric Pollution Control

Proposals to extend the range of gases and fumes included in the list of "noxious and offensive gases" which are controlled by the provisions of the Alkali, etc., Works Regulations Act, 1906, are being considered by the Minister of Health. A Draft Order has been prepared adding to the list volatile organic sulphur compounds; and fumes containing carbonaceous particles from black production works, and fluorine. The Draft Order is being circulated with a request that any observations should be submitted to the Ministry before 23rd July, 1949. A public inquiry will be held before the Order is confirmed.

Electrical Employment

The number of persons employed in the electrical manufacturing, contracting and electricity supply industries in Great Britain in April totalled 721,500, according to the *Ministry of Labour Gazette* for June. This compares with 721,700 in the previous month and 721,900 in mid-1948. At 9th May last there were 4,243 persons registered as unemployed in the electrical manufacturing industry, 1,550 in electrical wiring and contracting, and 842 in electricity supply.

District Joint Advisory Council

The inaugural meeting of the South-Western District Joint Advisory Council for the Electricity Supply Industry was held on 29th June at Electricity House, Bristol. The Council, which has been established in accordance with the provisions of the Electricity Act, 1947, consists of representatives of the Area Board, the South Western Division of the British Electricity Authority and organizations representative of persons engaged in the industry. It is concerned with safety, health and welfare, training and education, and it may also discuss other matters of mutual interest including efficiency in the operation of the Board's services.

The following officers were appointed:—Chairman, Mr. S. F. Steward (chairman of the South Western Board); vice-chairman, Mr. G. H. Kent; secretary, Mr. M. Skinner. The Council decided to set up a General Purposes and Efficiency Committee, a Welfare Education and Training Committee, and a Health and Safety Committee. The setting up of local advisory committees was also discussed, and it was decided to refer this matter to the General Purposes and Efficiency Committee, who were instructed to submit a scheme for the establishment of local committees to the next meeting of the Council which will be held at Taunton on 21st September.

Refrigerators for Housing Estate

It was typical refrigerator weather, with the thermometer registering 84 deg. in the shade, when part of an order for 270 Electrolux built-in type silent refrigerators was delivered to fifty Guildford Borough Council tenants recently. The Council is making these refrigerators available at a weekly rental of 1s 3d to the tenants on the Bellfields estate, which will eventually comprise about 1,000 houses.

Batti-Wallahs' Society

An interesting insight into the siege of Tobruk was given at the monthly luncheon of the Batti-Wallahs' Society on 30th June by Lt. Gen. Sir Ronald M. Scobie, now a director of British Insulated Callenders Cables, Ltd. Mr. Forbes Jackson, president, took the chair and among the guests present were Admiral Sir John Cunningham and Rear Admiral (L) S. L. Bateson. A telegram was sent to Sir Thomas Purves wishing him a speedy recovery from his illness.

Broadcast Transmitter for Denmark

The Danish Post and Telegraphs Department has ordered one of the new range of broadcasting transmitters designed and manufactured by Marconi's Wireless Telegraph Co., Ltd. This is a 100 kW air-cooled, medium-wave equipment with a frequency range of 525 to 1,605 kc/s. It will include a "high constancy" crystal drive. The new transmitter is to be installed at Skive and is expected to be working by the end of 1950.

Self-service Laundry

Following the opening in Queensway, Bayswater, London, of the first Bendix self-service "launderette" six weeks ago, a second unit was officially inaugurated last Friday at 82, Coombe Lane, Wimbledon, by the Mayor of Wimbledon, Alderman W. E. Hamlin. The installation, which differs somewhat from that at Bayswater, comprises twenty washing machines and three hydro-extractors.

Bendix Home Appliances, Ltd., do not propose to establish any further similar installations themselves, the two units being

intended primarily for experimental purposes, but initial plans are already in hand for the development of the first individually sponsored self-service launderettes.

Report on Poland

A compact survey of conditions in Poland and the possibilities of trade with that country has been published by the British Engineers' Association, 32, Victoria Street, London, S.W.1. It contains the results of an inquiry by the Association's Economic Research Division, supplemented by a short study-tour in May by Mr. C. F. I. Ramsden of the F.B.I., and Mr. A. W. Berry, director of the B.E.A. Of particular interest is a section dealing with the implications for the engineering industry in the 1949 Anglo-Polish Trade Agreement. Useful advice on trading methods is included in the report and one appendix gives the names of the State trading agencies, including that dealing with power plant and other electrical equipment.

Fountains for Toronto Exhibition

The United Kingdom Trade Commissioner at Montreal has had an inquiry for flood-lit fountains for the Toronto International Exhibition next autumn. United Kingdom manufacturers interested should write direct to Mr. R. A. Eshelby, Northern Electric Co., 1600, Notre Dame Street, Montreal, and notify the Commercial Relations and Exports Dept. (I.B.), Thames House North, Millbank, S.W.1, of any action taken.

"Change Your Cooker" Campaign

In May, the first month of a "Change Your Cooker" campaign organized by the Eastern Electricity Board, more than 1,000 consumers bought new cookers to replace their old, less attractive and less efficient electric models.

A.E.I. Brochure

Associated Electrical Industries, Ltd., has issued a brochure containing a review of the year 1948 by Mr. Oliver Lyttelton, the chairman. Numerous photographic reproductions are included, illustrating the company's wide range of products; also a diagram showing how each £ of the company's income for 1948 was spent.

Fluorescent Lighting in Car Assembly

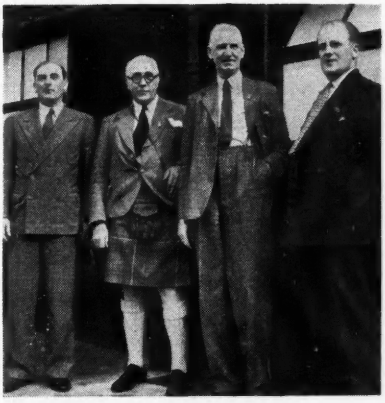
The use of fluorescent lighting fittings, set at the correct angle to ensure full light value where it is of most use, has resulted in an installation at the Doncaster works of Briggs Motor Bodies, Ltd., with several distinct advantages over the previous tungsten equipment. Installed by the company's own staff it consists of 150 of the adaptable "Ekco-Ensign" fittings, type FF13, modified for angle use, and using 5ft 80 W lamps. Chain suspended at 8ft above floor level on both sides of the motor car body assembly lines the fittings are in continuous rows in the working sections. The need for sufficient even lighting both inside and outside the car bodies, not obtained with tungsten lamps, was an important factor in deciding the height and angle of the fittings.

E.I.B.A. Meeting

The annual general meeting of the Electrical Industries Benevolent Association is to be held at the I.E.E. Council Room, 2, Savoy Hill, London, W.C.2, on 26th July at 11.30 a.m.

Mining Electrical Engineers

During the Association of Mining Electrical and Mechanical Engineers' Convention approximately 100 delegates took the opportunity to visit the Johnson and Phillips' Works at Charlton and Kidbrooke. At



At the J. & P. Works: Messrs. W. Glass (joint managing director), Bruce Russell (Edinburgh manager), G. A. McLennan (president, Association of Mining Electrical and Mechanical Engineers), and J. B. McRostie (sales manager)

Charlton the visitors watched many types of trailing and drill cables being manufactured, and also toured the mains cable and transformer shops in both of which many N.C.B. orders were in progress. Despite the heat of the day, a demonstration of the method of making wiped joints on seamless aluminium sheathed cables attracted much interest. At Kidbrooke the delegates were able to see l.v. and h.v. switchgear in course of manufacture. Welcoming the guests,

Mr. W. Glass, joint managing director of the company, paid tribute to the importance of the coal mining industry and to the increasingly important part played by the Association. In response, the president of the Association, Mr. G. A. McLennan, spoke of his long and happy association with J. & P. and in particular with the Edinburgh branch manager, Mr. Bruce Russell.

In connection with the Convention the Simplex Electric Co., Ltd., arranged a special display of colliery electrical equipment at its showrooms at 217-9, Tottenham Court Road, London, W.1, which included a new range of non-flameproof lighting equipment for collieries which was displayed for the first time.

Catalogues and Lists

Falk, Stadelmann & Co., Ltd., 91, Farringdon Road, London, E.C.1.—Four leaflets and one catalogue on fluorescent fittings, switched fuses, coffee makers and lighting fittings.

Siemens Electric Lamps & Supplies, Ltd., 38 & 39, Upper Thames Street, London, E.C.4.—Technical brochure (No. 169) illustrating house service meter type 23.

Ashley Accessories, Ltd., Morecambe Road, Ulverston, Lancs.—Illustrated catalogue of wiring accessories.

Gent & Co., Ltd., Faraday Works, Leicester.—Three catalogues on audible level indicating and recording equipment; floatless control equipment for pumps, valves, etc.; mining bells, d.c. relays, transformers, etc.

Electrical & General Accessories (Leicester), Ltd., Holyhead Road, Wednesbury, Staffs.—Eight folders on "Egatube" non-metallic conduit and fittings; the "Egaspray" airless spray gun; switched fuses and sockets and distribution boards.

Elcontrol, Ltd., 7, Arundel Street, London, W.C.2.—Catalogue and price list of industrial electronic control devices.

Trade Announcements

All the manufacturing assets and activities of Kelvin Bottomley & Baird, Ltd., and Henry Hughes & Son, Ltd., have now been transferred to **Kelvin & Hughes, Ltd.,** and henceforward all three factories at Hillington (Glasgow), Basingstoke and Barkingside will operate under this name.

From 11th July **Thorn Electrical Industries, Ltd.,** will be operating a new trade showroom and depot at 15, New Station Street, Leeds, 1. This depot, which will carry stocks of all the company's products, will be in charge of Mr. A. C. Page.

The Hinchley Engineering Co. (1949), Ltd., which was registered on 14th January and has acquired from the old Hinchley Engineering Co. all its assets and goodwill, has taken over from British Rola, Ltd., its factory in Pans Lane, Devizes, to continue the mass production of laminations and transformers.

Steatite & Porcelain Products, Ltd., have transferred their London office to Victoria Station House, 191, Victoria Street, S.W.1 (telephone: Victoria 7715).

Annual Holidays

While holidays at a few of the factories controlled by Philips Electrical, Ltd., are being "staggered," holiday periods at other factories are as follows: Mitcham, Brixton and Balham Works, 23rd July to 2nd August, inclusive; Blackburn Works, 16th to 24th July, inclusive; Hamilton Works, 30th July to 9th August, inclusive. Holidays are being "staggered" at Aboyne Works, Tooting, and at Waddon, Surrey.

Changes of Name

Installations Repairs, Ltd., have changed their name to L.H.P. Installation, Ltd., on June 8, 1949.

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month from 29th June.

MAGNAVOLT. No. 667,967, Class 7. Dynamo electric machines.—English Electric Co., Ltd., 28, Kingsway, London, W.C.2.

LAYSTALITE. No. 674,307, Class 7. Generating sets for use with lighting installations.—Laystall Eng. Co., Ltd., 53, Great Suffolk Street, London, S.E.1.

PERRAM. No. 669,163, Class 9. Electrical apparatus and instruments included in Class 9; wireless sets (complete) and scientific apparatus and instruments.—P. A. M., Ltd., Merrow Siding, Merrow, Guildford.

DELANIUM. No. 672,072, Class 9. Electrical apparatus and instruments included in Class 9; and scientific apparatus and instruments. No. 672,073, Class 11. All goods in Class 11.—Powell Duffryn Carbon Products, Ltd., Springfield Road, Hayes, Middlesex.

BRYLITE. No. 674,940, Class 9. Electric storage batteries.—M. F. Pilley, Ltd., 772, Pershore Road, Selly Oak, Birmingham, 29.

VREDEN. No. 674,020, Class 10. Electric massage machines.—V. F. W. de Wilton Vredenburgh, 16, Woodmansterne Road, Carshalton Beeches, Surrey.

DIAPANTOM. No. 674,879, Class 10. Surgical instruments.—New Electronic Products, Ltd., 2, South Audley Street, London, W.1.

CALTONA. No. B671,924, Class 11. Electrically heated caps for use in drying and reconditioning the hair.—Callinan Giles & Co., Ltd., 9, Newman Street, London, W.1.

VERSALITE. No. 674,184, Class 11. Electric lighting fittings made of plastics, metal or glass.—Troughton & Young (Lighting), Ltd., 143, Knightsbridge, London, S.W.1.

Industry and the House

Finance Bill Debate

By F. J. ERROLL, M.A., A.M.I.E.E., A.M.I.Mech.E., M.P.

WHEN Members returned to the House after an extra week's holiday during the Whitsun Recess, they did not expect such a formidable load of business as awaited them. The House sat up until well after midnight on five out of the first seven days after its return, and on one night the sitting went on till 6.10 a.m.

The main reason for the long sittings was the Committee Stage of the Finance Bill. It is on this stage that Members may press their own suggestions for tax revision, and consequently a very wide variety of subjects is always discussed. Some 55 new clauses were tabled, but the chairman permitted discussion on only 23. As had been expected, all discussion on purchase tax was ruled out of order, and so this vexing matter must be left over until the next Finance Bill.

Machinery Allowances

Of especial interest to industry was the debate on clause 16, which grants an increase in initial allowances for plant and machinery. This clause increases the initial allowance for wear and tear from 20 to 40 per cent. Mr. R. A. Butler pointed out that this is a valuable concession to industry, but it is certainly not a gift, being simply an advance of money which is taken back at a later date. It helps a certain number of companies for an intermediate period provided they are large enough and well enough off to have the capital to take advantage of the offer. Supporting Opposition speakers went on to show that the concession does not help small industries, nor does it help with the major problem of industry, namely, the difficulty of keeping pace with the rise in the cost of living. The rising costs of new plant and machinery have to be met out of a firm's own resources, which are themselves already being taxed at a very high rate.

The Solicitor General, in reply, showed that not only would a firm obtain a first annual allowance of 50 per cent of the cost of the new machine, but would also have the benefit of the allowances obtained while writing off the old machine. "It will have the whole of the sum necessary to replace a new machine at the increased cost." The Solicitor General's exposition was based upon machinery costing double what it cost before the war, but Mr. Butler insisted that the replacement cost was now three times the pre-war cost.

Further amendments attempted to make the concession retrospective for two years and thus give firms who had been enterprising some reward for their initiative. The Financial Secretary resisted this concession not only on the ground of the great cost to the Treasury but because the object of the concession was to help firms to replace machinery, and not those who had already carried out all necessary replacements.

Mr. Glenvil Hall also rejected an Opposition suggestion to extend the concession to cover industrial buildings, but he was prepared to apply it to laboratory buildings and not just the plant and machinery used in laboratories.

Income Tax Burden

The general debate on the Opposition's amendment to lower the standard rate of income-tax from 9s to 8s 6d aroused strong feelings on both sides of the House. Labour M.P.s adhered to the contention previously voiced by Sir Stafford Cripps that the irreducible needs of the nation must be paid for, namely, social services, food subsidies and defence, and that the Opposition should say which of these should be taken away in order to balance the Budget on a reduced rate of income-tax. The Opposition, led by Mr. David Eccles, who described the proposal as a declaration of war against the present penal level of taxation, pointed to the hardships which high taxation caused, the discouragement it represented to hard-working salaried executives, and the drain on industrial

capital. A general picture emerged of the British economy strained to the limit. If a lower rate could not be afforded by the Treasury, Members were left wondering what would happen if the present rate yielded less next year.

After the late sittings of the Finance Bill, a thin House gave a second reading to the Patents and Designs Bill. This Bill has already been thoroughly discussed in the House of Lords, when several important amendments were made. Sir David Maxwell Fyffe referred to the most important one. The Bill as originally drafted permitted a report from the Monopolies Commission to be taken as *prima facie* evidence of a restriction which would enable open licences of right to be granted in respect of a particular patent. As amended, the Government will still have to make an application to the Comptroller before taking action.

The second reading also provided an opportunity for Members of the Opposition to deal with the exaggerated stories of suppressed inventions which are repeated from time to time. Sir David mentioned the everlasting match, while another speaker described the French motor car which ran on water. The water was hydrolyzed by means of a powerful electric battery. The hydrogen and oxygen so produced was fed into an ordinary internal combustion engine in the correct proportions for an explosive mixture which actually propelled the car. No one, of course, had considered the energy required to charge the battery.

The House of Lords has been sitting late during the Committee Stage of the Iron and Steel Bill. Several amendments have been made in an endeavour to improve the Bill, but Government spokesmen have announced their intention of resisting the Opposition's proposal to defer vesting date.

Parliamentary News

By Our Special Reporter

IN the House of Commons last week Mr. H. D. Hughes asked the Minister of Town and Country Planning what stage had been reached in considering the proposals for the North Wales hydro-electric schemes.

Mr. Silkin said that the British Electricity Authority had explained to representatives of his department the proposals which they had in mind, and he was at present examining them. The proposals would require statutory authority, and before any decision was taken to proceed with them the local authorities and amenity societies concerned would be fully consulted. He and the Minister of Fuel and Power would carefully consider any representations made. As the proposals would have to be submitted to Parliament in a Private Bill, the question of public inquiry in the ordinary sense did not arise.

Mr. Silkin gave assurances that every alternative proposal, such as the utilization of the race of the Menai Strait, would be taken into consideration before any definite decision was reached, and also that the use of underground cables would also be considered.

Supplies at Chiswick

Mr. F. Noel-Baker raised the question of the supply of electricity to houses in Brentford and Chiswick, stating that the great majority of people living in them had never had the option of having electricity installed.

Mr. Robens, Parliamentary Secretary to the Ministry of Fuel and Power, said that in many spheres there were very good substitutes which the gas industry was able to provide. All the same, he agreed there was inconvenience. He need hardly remind the House that during the years of war there mounted up a "back-log" in the erection of power stations, and they were engaged in getting electricity into the rural areas so that they could assist the agricultural workers and farmers to do their job more efficiently. But a great deal of equipment and labour had to be used in wiring new houses, and there must be some sort of priority list. Where the Electricity Boards could extend the area of supply they were perfectly free to do so.

American Washing Machines

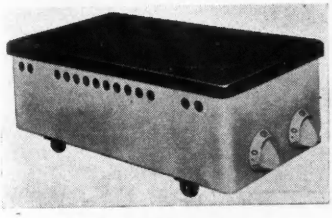
Replying to Mr. Driberg who referred to the sale at a London store of electric washing machines, made in the United States, at £49 10s each, Mr. H. Wilson said that licences had been granted during the last four years for the import from the U.S.A. of 735 domestic electrically operated washing machines, for sale on the home market, at a total cost of $69,000, c.i.f. The machines were imported under the Token Import arrangements.

RECENT INTRODUCTIONS

NOTES ON NEW ELECTRICAL AND ALLIED PRODUCTS

Twin Boiling Plate

TWO 6in 1kW boiling plates are incorporated in a twin boiling plate made by BELLING & CO., LTD., Bridge Works, Southbury Road, Enfield. The sheet-steel body

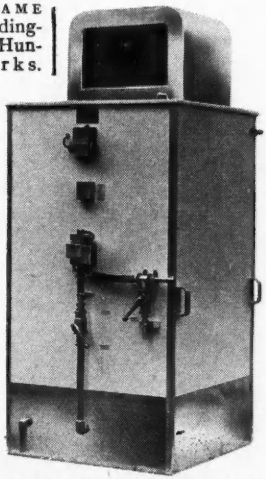


Belling twin boiling plate

is finished in white stove enamel, the hob being of black vitreous enamel. The overall dimensions are: width, 8½in; height, 6¼in; length, 16in. With three-heat switches the price is £7 6d; with "Simmerstats" £8 10s.

Milk Cooling Plant

A range of four chilled water milk cooling plants for the use of the dairy farmer is now being made by the LOHEAT FRAME Co., LTD., Eddington Works, Hungerford, Berks. The units couple up to any standard cooling tray and a single water storage tank is used. The refrigerated water is circulated at milking time and returned to the tank. No water is wasted other

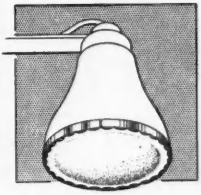


Loheat chilled water milk cooling plant

than the amount in the tray when it is disconnected for sterilizing. The milk is cooled to below 45 deg F and the design permits proper sterilization of the cooling tray. Both running and installation costs are low and the unit can be connected to a 5 A socket. The larger models provide a storage cabinet for the overnight milk. Prices are from £95 upwards.

Light Diffuser

It is well known that artificial light is one of the major causes of eye strain. In an effort to minimize this, a light-diffusing screen which can be fitted to any commercial, industrial or domestic lighting reflector has been placed on the market by LIGHTING IMPROVEMENTS, Vittoria House, Vittoria Walk, Cheltenham Spa, under the trade name of "Vellite." No special lamps are required, and two types of screen are produced, "Warm Light" and "Extra Daylight," the light from each of which blends perfectly with natural



"Vellite" diffusing screen fitted to a small industrial reflector

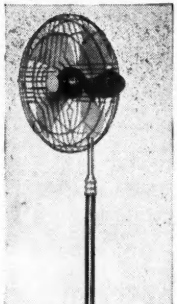
daylight and avoids glare. They are available in various sizes and are arranged to clip on to the rim of any existing reflector.

Circulator Fan

Produced primarily for overseas to compete with American products, but available also in this country, a 24in circulator fan made by the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, is eminently suitable for buildings where the decoration or architecture does not lend itself to the use of ceiling fans, or where portability is desired. The totally enclosed capacitor motor has a particularly clean outline, and is controlled by a built-in choke regulator which provides four running speeds (from 450 to 920 r.p.m.) and an "off" position. The streamlined appearance is further enhanced by the four broad blades, resiliently mounted in rubber, which merge into the contour of the motor.

Incorporating an anti-crash air-piston, the extending column has a positive quick-action locking device which securely fixes the fan in any desired position between 7ft 6in and 4ft 6in. A tilting device enables the air flow to be directed 10 deg above or below the horizontal. Adequate stability is ensured by a three resting-point base.

The chocolate brown finish is over-sprayed with gold. With an air displacement of

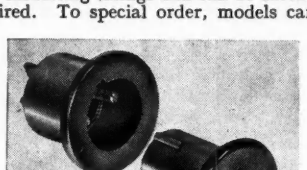


G.E.C. circulator fan

10,000 cu ft per minute and a consumption of only 150 W, this new fan is available for a.c. single-phase only.

Mains Connector

A two-pole moulded mains connector produced by A. F. BULGIN & CO., LTD., By-Pass Road, Barking, Essex, is rated at 5 A for 250 V use or at 1 A on 500 V. High quality thermo-setting plastic material is used, normally black, but in special colours if ordered in quantity. Connectors are also made with three and six poles. The socket member has a large mushroom head for ready handling and there is a firm metallic cable-grip, which can be provided with insulating linings and can be earthed if required. To special order, models can be



Bulgin mains connector

supplied with pins of different length. The connectors are non-reversible, thus preserving through polarity. Prices are: two-pole type 5s 9d each, three-pole type 6s 3d, six-pole 8s 3d.

Leakproof Battery

A dry battery cell which will not leak, swell or decompose and remains in new condition during its shelf life is now being made by ALPHA ACCESSORIES, LTD., Dawley Works, Hayes, Middlesex. It also withstands rough handling and wide temperature varitions. These advantages are obtained by the use of specially selected materials and a doubly insulated, doubly sealed steel container which completely encases the cell.

Food Mixer

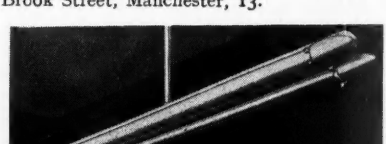
A food mixer made by EASIPOWER, LTD., 213-215, Gloucester Place, London, N.W.1, has two contra-rotating twin beaters which are instantly detachable for cleaning. High and low speeds are available, and the induction motor is protected against excessive overload by an automatic thermal switch. The power head

Easipower food mixer

can be adjusted to suit different basin heights and can be readily detached and used as a separate unit. The price is £8 4s, plus £2 3s 6d purchase tax.

Twin Fluorescent Fitting

A novel method of assembly makes the "Simplug" twin fluorescent fitting especially neat and compact in appearance. Aluminium tube 3in in diameter is used for the body of the fitting which houses the control gear, with two domed ends protecting the starter lamps. The two 40 W fluorescent tubes are held by four chromium spring clips and are covered at the ends by four plastic torpedo-shaped end pieces. The fitting is suspended by a ¾in tube, to one end of which is fitted a "Gregg" plug-type ceiling rose, thus enabling the whole unit to be removed bodily from the ceiling for cleaning or lamp replacement. The rounded shape prevents the collection of dust. The finish is white stove enamel. The fittings, which sell at £8 15s, less lamps, are made by the DUPLEX PATENTS CO., 106, Upper Brook Street, Manchester, 13.



"Simplug" twin fluorescent fitting

Electricity Supply

Big Development Plan : Scottish Transmission Schemes

DETAILS of what he described as "the biggest scheme of distribution ever planned in this country, or the world," were outlined by Mr. J. Eccles, chairman of the Merseyside and North Wales Electricity Board, to members of the Consultative Council at Llandudno last week. He said that the proposal was to extend electricity supplies to rural districts, and a survey had revealed that there were 2,500 square miles of hilly country in North Wales with no supply of electricity, and 45,000 premises more than half a mile away from any point of supply. He added that the cost of taking a supply to the premises outlined in the survey would be in the region of £12,000,000, and he estimated that if the flow of material could be increased to twice the present rate, the project would take 15 years to complete.

Collier Launched

William Pickersgill and Sons, Ltd., Sunderland, have launched the collier *Poole River* (1,700 tons) built for the British Electricity Authority. The vessel was named by Lady Citrine, wife of the chairman of the B.E.A. At a reception after the launching, Lord Citrine said the B.E.A. intended to build power stations on navigable rivers so that the fuel needed could be carried by ship. The *Poole River* would carry coal to the power station at Poole, Dorset, and it would take 370,000 tons of coal to keep Poole power station going for one year.

Electricity Output

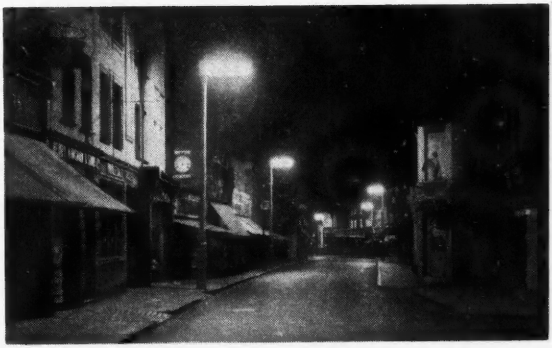
In the week ended 24th June 731.6 million kWh was sent out from solid-fuel fired stations of the B.E.A. and North of Scotland Hydro-Electric Board. This compares with 741.1 million kWh in the previous week and 706.1 million in the week ended 25th June, 1948.

Tynemouth Loan Charges

Subject to the approval of the Ministry of Health, Tynemouth Town Council has approved a proposal by the British Electricity Authority for a scheme of equation whereby charges outstanding on several loans would be considerably reduced. The outstanding debt at the end of March this year was £108,364, which it was suggested should be repaid by a payment of £10,364 during 1949-50, followed by ten instalments of £9,800 per annum. Reference was made to certain advantages which would result to the Corporation from such a plan.

Fluorescent Street Lighting

For the lighting of High Street, Watford, twelve "Mazda" fluorescent lanterns are used, each housing three 80 W 5ft lamps. The lanterns are mounted on square concrete columns of pleasing daytime appearance, at a height of 25ft, and spacing is in staggered formation at an average distance of 120ft. The scheme provides excellent glare-free illumination at an approximate level of 5,600 lumens per 100ft linear of roadway. The installation was officially switched on by the Mayor of Watford on 20th June.



"Mazda" fluorescent street lighting in High Street, Watford.

Scottish Transmission Lines

Three more schemes of the North of Scotland Hydro-Electric Board covering the erection of overhead transmission lines from Fannich to Boat of Garten and from Fasnakyle to Beauly in the north, and from Shira, Argyllshire, to Inveruglas in Dunbartonshire, have been confirmed by the Secretary of State for Scotland, and were presented to Parliament last week. The Fannich to Boat of Garten line (Scheme No. 10) will carry electricity generated at

the Hydro Board's Fannich project to link up with the existing transmission lines near Boat of Garten. This scheme is estimated to cost £800,000 and includes the erection of a transforming station near Beauly where the other new transmission line from Fasnakyle to Beauly (Scheme No. 14) will join it. This latter scheme will carry electricity generated at the Hydro Board's Affric project and is estimated to cost £380,000. The new line from Shira in Argyllshire to Inveruglas in Dunbartonshire (Scheme No. 21) will transmit electricity generated under the Glen Shira project at the head of Loch Fyne to the transforming station at Inveruglas and thus to the Central Scotland grid. The estimated cost is £190,000. Recommendations of the Amenity Committee have been given effect to with the exception that, for technical reasons, the Board was unable to accept the Committee's recommendation that only one line of towers should be erected on part of the Fannich to Boat of Garten line between Grudie Bridge and Beauly, instead of the two proposed.

S.W. Scotland Capital Programme

At a meeting in Glasgow on 30th June of the S.W. Scotland Electricity Consultative Council, over which Councillor A. B. Mackay presided, an outline of the Area Board's extensive capital programme was considered. It was stated that the amount of expenditure on capital works initiated during the current year was £6,247,200, and the amount actually to be carried out this year was estimated at £1,098,870. A sum of £2,142,300 was to be spent over seven years for the change-over from d.c. to a.c. It had been decided to proceed at once with the change-over of the remaining d.c. consumers in Hamilton.

Revenue from Surcharge

It was stated at a meeting of the S.W. Scotland Electricity Consultative Council that revenue attributable to the surcharge which the Board had derived from the 216,500 consumers in the Glasgow Sub-Area amounted to £104,500, an average of only 9s 8d per consumer.

Irish Restrictions

Because drought has reduced the water available for the generation of electricity in Ireland, the E.S.B. has found it necessary to impose a number of restrictions on consumption. The use of electricity for space heating is prohibited. Those who use electricity for heating water must not exceed 50 per cent of the basic consumption allotted to this purpose on the ration card for the current two-monthly period; consumption of electricity for cooking must not exceed 90 per cent; and the ration for private lighting is reduced to 75 per cent. For the time being no restrictions are imposed on motive power, industrial process heating, traction and public lighting.

Local Committees

It was reported at a public meeting of the East Midlands Consultative Council at Nottingham last week that the Minister of Fuel and Power had approved a scheme submitted by the Council for the establishment of four Local Committees to represent the Council in the following localities:—Those parts of Derbyshire and Nottinghamshire in the Board's area; the part of Lincolnshire in the Board's area, together with the county of Rutland; Leicestershire and parts of Warwickshire; Northamptonshire and parts of Buckinghamshire.

All-Electric House Costs

Hoylake (Cheshire) Council has decided to send letters to the Minister of Fuel and Power, the Merseyside and North Wales Electricity Board and the local M.P., complaining of the hardship imposed on consumers by the "outrageous" increase in the price of electricity. It was stated that 60 per cent of houses built by the Council were all-electric, because the Ministry of Fuel had, in the past, stressed the need to save coal; a working man might now find himself faced with an electricity bill of £1 per week.

Tests on a Cooker

EVIDENCE of tests which he had carried out on an electric cooker was given by Mr. Brian Wells, electrical engineer, at the resumed inquest at St. Pancras last week on a 64-year-old woman, Mrs. Agnes Blake, who was found lying on the floor of her home apparently electrocuted. Mr. Wells said that he had thoroughly examined the cooker and found it incapable of giving a shock under normal usage. He had even poured water all over it but did not get a shock. He added that cookers were fitted with safeguards which it would be quite a feat to foil.

A pathologist who at the opening of the inquest had expressed the view that Mrs. Blake was electrocuted, said at the resumed hearing that the woman's burns could have been caused by falling on the stove and not by electric shock.

A representative of the British Electricity Authority, who stated that great importance was attached to the case, offered evidence by a Home Office pathologist, but the Coroner said that it would not be necessary. He recorded a verdict of "Accidental death" and said there was now no suggestion that the stove was faulty.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

British Insulated Callender's Cables, Ltd., is holding its fourth annual general meeting on 22nd July. In a circulated statement Sir Alexander Roger, the chairman, said that the substantial improvement in profits was due to a considerably higher turnover resulting from an easier supply position in certain raw materials, increased efficiency, expansion of manufacturing facilities, and the splendid effort by personnel. The crippling burden of taxation absorbed in the parent company £2,015,896, or 53 per cent of profits, while in the group as a whole the charge was £3,577,527. Turnover showed an increase in value of 41.5 per cent, home sales being up 29 per cent and export sales no less than 86 per cent. Direct exports amounted to nearly £10,000,000 in 1948 and outstanding orders both from home and abroad were still very substantial, though with increasing import restrictions and the definite change from a sellers' to a buyers' market business was becoming more difficult.

The most substantial overseas markets were still in Australia, New Zealand, India, Pakistan, South Africa, Argentina and Brazil, together with those countries in which the telephone companies with which they were connected operated, namely, Portugal, Venezuela and the West Indies. They were again endeavouring to increase their business in North America, but the difficulties were very considerable especially in view of the advantages possessed by certain manufacturers there in the supply of base metals. Substantial increase in power transmission schemes overseas had been a notable feature of 1948 with particular activities in India, Portugal and Uganda.

The company had recently received an order from the B.E.A. to supply and erect a section of the first transmission line in this country to work at 275,000V. Important contracts from industrial concerns included the whole of the cables for the new plant of the Steel Company of Wales at Port Talbot, which when completed would be the most modern of its kind in the world. On the telecommunication side orders of special interest included the Northampton-Derby carrier cable, a 750ft television mast at Sutton Coldfield, a 500ft radio mast at Wrotham and four 325ft masts in Denmark for the Decca Navigator Company's navigation chain.

Good progress had been made with the Liverpool Street-Shenfield railway electrification scheme and it was hoped that work would be resumed shortly on the Manchester-Sheffield-Wath lines. Good progress had also been made on the Brazilian railway, Estrada da Ferro Santos Jundiai (formerly São Paulo Railway), and negotiations were in progress for important schemes of great potential value in many parts of the world.

The London Electric Wire Co. & Smiths, Ltd.—Mr. W. J. Terry, chairman and managing director, stated at the annual general meeting last week that the improvement in profits was entirely due to the turnover having been maintained at a high level throughout the year and was not the result of increased selling prices. During last year there had been very heavy demands for their products, but the position had quite recently changed and there were signs of a general recession. It was reasonable to expect that this recession was temporary because there were so many large projects in the electrical field as yet barely commenced. He believed that trade generally was facing a period of severe competition not only at home but particularly in overseas markets.

Walsall Conduits, Ltd., record a net profit, including dividend from subsidiary company, for 1948, after taxation, amounting to £159,658 (£121,957), plus dividends from subsidiary company to 31st December, 1947, £17,003. General reserve receives £20,000 (same) and a final dividend of 35 per cent is again to be paid and the bonus of 15 per cent is to be repeated. A sum of £277,452 (£184,041) is carried forward. A statement by the chairman, Mr. A. E. Read, states that in recent years the company has introduced new and improved products, which are now in full production and they are working to full capacity. Improved methods of production, by installation of the most modern machinery and regrouping, have been effected and they cannot further substantially increase output until additional factory floor space is made available. The volume and extent of their export trade was still unfortunately limited to the number of licences allowed to them for shipments.

The Telephone Manufacturing Co., Ltd.—At the annual meeting on 4th July, Mr. F. T. Jackson (chairman and managing director) said that they had been successful in developing their export trade to a considerable extent; export orders during the year amounted to 55.5 per cent of the total orders received, and in the first three

months of the current year rose to 79 per cent of orders received. The great difficulty with which they had to contend in the export market was price. The high prices were brought about by high material costs created by the Government's persistence in its policy of bulk buying. In addition, nearly all countries were restricting imports. The state of their order book was good and the 1949 results would not be unsatisfactory. The success of the Carpenter high-speed polarized relay had been phenomenal and there had been a steady expansion in sales of this product. During the year they had continued to devote a great deal of attention to research and development work.

Richard Johnson & Nephew, Ltd.—At the annual general meeting on 24th June the chairman, Mr. M. A. T. Johnson, said he was able to report that during the year the company had more than doubled its output of certain classes of wire, including land and submarine cable wire, and wire for the manufacture of electrodes. They had been prevented from going ahead as planned with exports of ferrous products owing to lack of export licences. With home trade bottlenecks overcome surely some reasonable increase in the tonnage they were permitted to export was due.

The Lightfoot Refrigeration Co., Ltd., held its annual general meeting on 29th June. Mr. F. Ryder, the chairman, said that the turnover of the engineering departments showed a substantial increase both in the export and home markets, and the volume of orders in hand could be considered very satisfactory.

Franco Signs, Ltd.—At the annual general meeting on 29th June, Mr. J. F. Mallabar, chairman, stated that the removal of the lighting restrictions would in due course have an extremely beneficial effect on the company's business and the future of the company would now appear much clearer. New forward contracts for the hiring of signs were already coming through in substantial amounts.

Hall Telephone Accessories, Ltd.—Major the Hon. Oscar M. Guest, chairman, stated at the annual general meeting recently that the company had been fortunate in obtaining continued work from the British Post Office and there was some expansion of business with overseas postal departments.

Atlas Electric & General Trust, Ltd.—Mr. Donovan M. Touche, the chairman, stated at the annual general meeting on 23rd June that their income through investments amounted to £453,248, an increase of £72,929, which was certainly very satisfactory, as the net proceeds of the Montevideo sale brought in a gilt-edged return only. Their purchasing commissions were likely to decline this year because many tramway routes in Montevideo had been abandoned and it was apparently the intention gradually to eliminate trams from the city within the next six to eight years.

John Thompson, Ltd., report a group trading profit in 1948 amounting to £721,530 (£370,329), plus reserve for deferred repairs £28,177 (£36,952) and investment income £27,554 (£23,892, including tax credits). Depreciation takes £83,282 (£65,930), pensions £26,994 (£24,858), audit fees £2,041 (£1,941) and tax £330,017 (£219,761, including E.P.T.). A final dividend of 10 per cent (12½ per cent) again brings the total dividend to 17½ per cent. A bonus of 5 per cent (same) is also to be paid. Investments reserve receives £1,050 (£26,350), contingencies £5,000 nil), general reserve £175,000 (£50,000), dividend reserve nil (£15,000) and bad debt reserve £1,700 (nil), leaving £458,467 (£370,930) to be carried forward.

Pye, Ltd., recommend a finial dividend of 3 per cent on the 8 per cent participating preferred ordinary stock, together with a participating dividend of 2 per cent, making 10 per cent for the year (same). The deferred ordinary stock is again to receive 25 per cent. The consolidated net profits for the year ended 31st March amounted to £268,723 (£267,807).

Pye (Ireland), Ltd., report trading profits for the year ended 31st March amounting to £28,707 (£25,417). Depreciation and obsolescence take £4,706 (£3,232), tax £13,000 (£10,000), bad debts reserve nil (£900), and staff pension fund nil (£2,000). A final dividend of 15 per cent again brings the total distribution to 20 per cent and £16,970 (£15,458) is carried forward.

Keith, Blackman, Ltd., show a trading profit for the year ended 31st March amounting to £302,496 (£222,051), plus interest, making £303,036 (£222,116). The ordinary dividend is maintained at 20 per cent and in addition a bonus of 5 per cent is to be paid. The carry-forward is increased from £48,632 to £58,973.

Philips' Incandescent Lamp Works Holding Co. (Eindhoven) is again to pay dividends of 9 per cent on the ordinary and 6.6 per cent on the 6 per cent participating preference shares.

The Reno!d & Coventry Chain Co., Ltd., reports a group profit for the year ended 3rd April last of £821,374, as compared with £504,452 for the preceding forty weeks, and a net profit, before taxation, of £449,244 (against £251,262). After providing for taxation, the net balance is £264,259 (against £154,916). It is proposed to pay a final ordinary dividend of 12 per cent,

making 15 per cent for the year. For the previous period the total dividend was 12 per cent.

The **Kalgoorlie Electric Power & Lighting Corporation, Ltd.,** reports a profit for the year ended 31st December last of £28,356, to which is added £10,361 brought in. After providing for taxation and allocating £10,000 to depreciation reserve, there is a balance of £21,947. The dividend for the year is unchanged at 7 per cent, less tax, general reserve receives £4,500 and £10,228 is carried forward.

The **Barbados Electric Supply Cpn., Ltd.,** is to hold an extra-ordinary general meeting on 18th July to consider a proposal to increase the authorized capital to £350,000 by the creation of 150,000 4½ per cent £1 cumulative preference shares.

British Rola, Ltd.—It is reported that the business of the company and of its subsidiaries has been sold as a going concern in order to meet in full the sums owing to the debenture holders, Lloyds Bank, Ltd. A surplus sufficient to pay unsecured creditors 15s in the £ is expected. There will be nothing for payment to the preference and ordinary shareholders. A receiver and manager was appointed on 3rd June last.

Southern Areas Electric Corporation, Ltd.—In our report of Sir Arnold Gridley's speech at the annual meeting held on 22nd June, we incorrectly stated that the company and its subsidiary, New Day Electrical Accessories, Ltd., were transferring to new premises. The position is that the company has taken over a modern factory building in Birmingham to which is being transferred a plastic moulding business acquired last year, and the business of its subsidiary New Day Electrical Accessories, Ltd.

J. & E. Hall, Ltd., are again to pay an interim dividend of 2½ per cent.

Hoover, Ltd., are maintaining their interim dividend at 10 per cent.

The **Mirrlees Watson Co., Ltd.,** is again paying an ordinary dividend of 8 per cent.

Hick, Hargreaves, Ltd., are to pay a final dividend of 8 per cent (same) making 10 per cent (same).

New Companies

Ankobra River Power Co., Ltd.—Registered 28th June. Capital £200,000. To produce, generate, use, store, regulate, transform, transmit, measure and distribute electrical energy or power, etc., and to enter into an agreement with Bremang Gold Dredging Co., Ltd., Ariston Gold Mines (1929), Ltd., and Gold Coast Main Reef, Ltd. Subscribers: J. W. Price and J. A. Griffiths, and five others. Solicitors: Birkbeck Junius Edwards & Coburn, 49, Moorgate, E.C.2.

Evans Electronic Developments, Ltd.—Registered 21st June. Capital £1,000. Manufacturers and designers of electrical, electronic, radio and scientific apparatus, etc. Directors: R. S. Evans, K. W. Evans and W. S. Evans. Secy.: K. W. Evans. Regd. office: 2a, Birchfield Road, Birmingham, 19.

Receivers Appointed

Stamford Electrical, Ltd.—E. D. Basden, 73, Basinghall Street, E.C.2, was appointed receiver on 30th May, under powers contained in debenture dated 6th February, 1948.

Electronic Products (Glos.), Ltd.—L. W. Euler, 18, Low Pavement, Nottingham, was appointed receiver and/or manager on 31st May, under powers contained in debenture date 28th March, 1947.

J. Hanson (Refrigeration), Ltd.—H. Price, 21, Gildredge Road, Eastbourne, was appointed receiver and manager on 30th May, under powers contained in debenture dated 14th May.

Receiver Released

Air Ducts, Ltd.—R. G. Leach, 11, Ironmonger Lane, E.C.2, ceased to act as receiver and manager on 9th June.

Bankruptcies

J. F. Hibbert, electrician, formerly carrying on business at 64, Knott Lane, Bardsley, Ashton-under-Lyne.—First meeting held 7th July at the Official Receiver's office, 20, Byrom St., Manchester. Public examination 28th July at the Court House, Oldham.

S. W. Morley, radio and electrical engineer, carrying on business as "Morleys," Bow St., Rugeley.—Trustee, Mr. P. J. Snow, 17, Albion St., Hanley, Stoke-on-Trent, appointed 23rd June.

T. Bickerstaffe, electrical contractor, 131, Ribbleton Lane, Preston.—Proofs for dividends by 12th July to the trustee, Mr. F. C. Ormrod, 20, Byrom St., Manchester, 3, Official Receiver.

G. S. Douthwaite, carrying on business at 25, Dean Street, Newcastle-on-Tyne, under the style of G. S. Douthwaite & Co., electrical engineer.—Supplemental dividend of 6s. 7d in the £, payable 22nd July at the Official Receiver's office, Gibb Chambers, Newcastle-on-Tyne.

Liquidations

Wilma Supplies (Stockport), Ltd.—Creditors' voluntary winding-up. Liquidator, Mr. B. H. Allen, 115, Wellington Road South, Stockport, Ches., appointed 8th June.

STOCKS and SHARES

WEDNESDAY in the current week was expected to produce a gravely important announcement from the Government on the question of the country's gold and dollar reserves. In advance of this Stock Exchange markets continued erratic and nervous, with a good deal of spasmodic selling, countered by an occasional bout of buying. With the outlook at home and abroad so unsettled Stock Exchange prices stand little chance of making headway, and although the fall of the past few days has been comparatively mild, prices on balance show declines as compared with a week ago.

British Electricity Stocks

The abruptness of day-to-day price movements in the gilt-edged market makes comment quickly out of date, but it can be recorded that the descent, which ran practically unopposed through the greater part of June, is meeting with a check to its progress. Thus, British Electricity 3 per cents, 1974-77, after marking last week down to 97⅛, rallied to 98⅛; this is still 3 points down on the past month. The "threes" of 1968-73 picked up to 99⅛ after changing hands below 98; they were 102¼ a month ago. British Transport 3 per cents, redeemable 1978-88, have been down in the past week to 94 and are 96¼ at the time of writing.

Cables Lower

British Insulated Callender's at 32s have recovered 2s. English Electric are better at 45s; Lancashire Dynamo hardened to 95s. Most of the other changes are in the downward direction. De La Rue at 26s 3d are 3s 9d down; Reyrolle 57s 6d, and Lucas 67s 6d, are both 2s 6d lower. Other falls range generally from 3d to 1s 3d. Cable & Wireless stocks are easier; the ordinary at 120⅛ being 6 points down, and the preference 3 points at 108½. Marconi Marine shed 2s 6d at 25s. The "heavy" group is a little better with Babcock & Wilcox, at 59s 6d, a florin higher on the week.

B.I.C.'s Dividend

Trading profits, before tax, of the British Insulated Callender's group increased by £2 million last year, to a total of £6⅛ million. In the statement accompanying the accounts, Sir Alexander Roger removes any illusions about the margin of industrial profits. Wages, materials and supplies took nearly 18s 9d out of every £1 of the company's sales. Of the remainder, nearly half went in taxation, leaving just 5½d out of 20s for dividends and reserves. In actual figures, taxation absorbed over £3¼ million, leaving, after depreciation, a net surplus of £2,338,000. Less than one-fifth of that figure was paid out in dividends, including those on the preference stock. Restriction of the ordinary dividend to 6.2/3 per cent was in accordance with the dividend limitation agreement. Shareholders are assured of the board's opposition to any tendency for the latter to assume a permanent character.

Walsall Conduits

For the third year running this company is adding a 15 per cent bonus to the 55 per cent dividend paid since its registration in 1936. Net profit, before tax, is 17 per cent up on the figure for 1947. Group earnings were equivalent to 210 per cent on the £150,000 ordinary capital. There has been a further strengthening of reserves; the latter substantially exceed the total capital of £350,000. Now 57s 6d, the 4s shares are—like most others—at the lowest point of the year, but since the highest over the past eighteen months was 62s 3d, they can claim to have put up a better-than-average resistance. On the 70 per cent payment, the yield is £4 17s 6d per cent. The 5 per cent preference shares are offered at 25s 3d, and pay just under 4 per cent.

British Electric Traction

Wide swings in the price of B.E.T. deferred stock have again been conspicuous even in the general disturbance of markets. Despite the appearance of an eminently satisfactory profit statement, the present price of 1505 shows a net loss over the past few months of some 470 points from the best price reached. The market takes the view that the nationalization possibility remains a ruling influence on the quotation. At the reduced level, the price of the stock affords a yield of no more than 3⅛ per cent, and evidently gives certain hostages to the sort of fortune which befell Thomas Tilling shareholders.

Preference Shares

Events in the gilt-edged market have reacted, naturally enough, on the market for industrial preference shares, amongst which the investor is beginning to have some unaccustomed freedom of choice on a 4 per cent yield basis. Leading 4 per cent issues are within sight of par, Reyrolle "fours," for instance, being offered at 20s 9d. Returns of just over 4 per cent are available now from Crompton Parkinson "sixes" at 29s 6d, Hoover 5⅛ per cents at 27s, and from the 7 per cent issues of Automatic Telephone at 34s 9d, and Electric Construction at 33s 6d. Popularity of the lower-priced shares is witnessed by the yield of £4 2s 9d per cent on G.E.C. 7⅛ per cents; this is 6s more than the return on the company's junior 4¼ per cent shares at 2s 3d.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Argentina.—18th August. Municipality of La Plata. 46 trolley-buses, 45 km of overhead wires, workshops, repair materials, spares, etc. Tenders must be presented by accredited local agents. (C.R.E. (I.B.) 17085/49. Ten/468/I.B.1.)*

Breconshire.—County Council. Electrical installation at proposed secondary modern school, Gwernyfed, Three Cocks. Applications for specifications, etc., to be made by 14th July. (See this issue.)

Carlisle.—Corporation. Electrical installations in 36 flats on the Wigton Road housing estate. City engineer, 18, Fisher Street.

Durham.—County Council. Electrical installation in new workshop block for Stockton Technical College. County architect, Court Lane, Durham.

Halifax.—22nd August. Education Committee. Electrical installations at Crossley and Porter Schools. Savile Park. (1st July.)

India.—NEW DELHI.—12th July. Directorate-General of Industries and Supplies. Insulated cable and joint boxes. (C.R.E. (I.B.) 17221/49. Ten/466.)*

Manchester.—16th July. Education Committee. Electrical installation at Baguley Hall Secondary School. (1st July.)

Morocco.—TANGIER.—12th August. Telefonica de Tanger S.A. Supply of 7 km of insulated cable. (C.R.E. (I.B.) 17890/49. Ten/476.)*

Newcastle-on-Tyne.—Education Committee. Extension of electrical installation at the Chillingham Road School. City architect (Education Section), 31, Northumberland Road.

New Zealand.—WELLINGTON.—1st August. General Post Office. Cadmium copper wire, binders and tapes. (C.R.E. (I.B.) 17943/49. Ten/464.)*

1st August. Auckland Electric Power Board. 11kV and 6.6kV cable. (C.R.E. (I.B.) 18151/49. Ten/472/I.B.2.)*

Pakistan.—22nd July. High Commissioner. 18,390 miles of electric cable. (1st July.)

St. Neots.—27th August. U.D.C. Electrically driven vertically suspended pump, with equipment. John Taylor & Sons, Artillery House, Artillery Row, London, S.W.1.

Seaton Valley (Northumberland).—Urban District Council. Electric cookers, wash boilers and fires for 38 houses at Seghill. Surveyor, Council Offices, Seaton Delaval.

South Africa.—CAPE TOWN.—2nd August. Low-voltage overhead line service fuses. (C.R.E. (I.B.) 18077/49. Ten/470/I.B.2.)*

Stretford.—14th July. Town Council. Electrical installation in flats (32), Moss Vale housing site. (See this issue.)

Uganda.—1st August. Electricity Board. Switch-fuse gear, motors and starters, domestic apparatus, lamps, cables and wiring materials. (See this issue.)

Walsingham.—25th July. R.D.C. Duplicate electrically operated deep-well centrifugal pumping plant for regional water supply scheme. A. P. I. Cotterell & Son, 54, Victoria St., Westminster, S.W.1.

* Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.

Orders Placed

Tynemouth.—Town Council. Electric wiring and fittings in 266 houses on the Marden neighbourhood unit (£6,632).—Electrical Equipment, Ltd., North Shields.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Adwick-le-Street.—Houses (30), Woodlands; W. S. Ellis, surveyor to U.D.C.

Aireborough.—Houses (8), Westbourne Drive; H. Watkinson & Sons.

Ashby-de-la-Zouch.—Houses (32), Burton Road, for U.D.C.; L. Swanwick, architect, 44, London Road, Coalville.

Atherton.—Houses (52), Brierfield Avenue; J. C. Prestwich & Sons, architects, Bradshawgate Chambers, Leigh, Lancs.

Barking.—Flats (108), Longridge Road; borough architect, Town Hall.

Barnard Castle.—Houses (48), Station Road; North-Eastern Housing Association, Northumberland Road, Newcastle-on-Tyne.

Bolton.—Adaptation of of "Egerton Lodge" as hostel for aged (£10,200), for Welfare Committee; borough surveyor.

Canteen and welfare department at Shepherd Cross Street for William Edge & Sons, Burnden Works; Thomas E. Smith & Son, architects, Central Chambers, Folds Street, Bolton.

Bradford.—Houses (150), Buttershaw site; city architect.

Bridgwater.—Houses (60), Hamp estate; borough surveyor.

Brighouse.—Foundry and machine shop, Arthur Street; C. H. Broughton (1934), Ltd., ironfounders.

Bristol.—Houses (200), slopes and 96 three-storey two-bedroom self-contained flats at Lawrence Weston; city architect, Eagle House, Bristol.

Modern home for old people at Southmead (£40,000); city architect.

Bromsgrove.—Houses (48), Charford estate, Section 1, for U.D.C.; Baylis & Baylis, surveyors, 118, Colmore Row, Birmingham, 4.

Cambridge.—Primary school, Newmarket Road; T. V. Burrows, architect, Guildhall.

Canterbury.—Abattoir (£75,000); L. Hugh Wilson, city architect.

Chapel-en-le-Frith.—Houses (12), Castleton, for U.D.C.; H. Haywood, builder, 354, Loxley Road, Sheffield, 6.

Chester.—Houses (10), Christleton, near Chester, for R.D.C.; H. Beswick, 19, Newgate Street, Chester.

Crawley.—Houses (105), West Green site; chief architect, Crawley Development Corporation, Broadfield, Crawley, Sussex.

Croydon.—Houses (200), New Addington estate; borough engineer.

Dartford.—Houses (58), Temple Hill estate, in two groups; T. Armstrong, town clerk, High Street.

Derby.—Estate of cottage homes; Linen and Woollen Drapers' Cottage Homes, Ltd., Hammers Lane, London, N.W.7.

Houses (74), Chadderton Hall estate, for Town Council; M. L. Francis, surveyor.

Dunstable.—Additions and alterations to Town Hall; R. R. Hole, architect, Municipal Offices.

Easington.—Houses (110) on 11 sites for the R.D.C.; surveyor, Council Offices, Easington.

East Ham.—Cinema, Monega Road; L. Allen, architect, 109, Jermyn Street, S.W.1.

Elstree.—Houses (33), for Harrow U.D.C.; engineer, Council Offices, Stanmore.

Esher.—Dwellings (40), Grange estate; surveyor, Urban Council Offices, Esher, Surrey.

Exeter.—Second section (£50,165), Summerway Primary School; city architect.

Houses (195), Stoke Hill and Countess Wear estates, for T.C.; Wilson Lovatt & Sons, Ltd., builders, Clarence Street, Wolverhampton.

Fareham.—Houses (146); U.D.C. surveyor.

Felling-on-Tyne.—Mineral water bottling factory for G. Towers; Wilson Engineering Co., 44, Dean Street, Newcastle.

Gateshead-on-Tyne.—Industrial health clinical unit at Bensham Hospital (20 beds with laboratory, etc.); P. H. Knighton, architect, Newcastle Hospital Board, Osborne Road, Newcastle.

Glasgow.—Houses (200), Milton site, for T.C.; Blackburn (Dumbarton), Ltd., builders, Dumbarton.

Greenford.—Cinema, shops, etc., Ruislip Road; Associated British Cinemas, Ltd., 30, Golden Square, W.1.

Harold Hill (Essex).—Houses (1,450), for L.C.C.; W. & C. French, Ltd., builders, 50, Epping New Road, Buckhurst Hill.

Harwich.—Large factory; Standard Yeast Co., Ltd., Lamb Distillery, Church Street, Chiswick, W.4.

Hetton-le-Hole.—Welfare and health clinic; G. R. Clayton, county architect, Court Lane, Durham City.

Heywood.—Houses (44), Chapel Street; James Berry, Ltd.

Huntingdon.—Additions and alterations, Shire Hall, Market Hill; S. J. Hands, county architect, County Buildings.

Hyde.—Houses (68), Harbour Farm estate, for T.C.; borough surveyor.

Kent.—Scheme for the establishment of 150 health centres in the county; county architect, Springfield, Maidstone.

Leigh.—Houses for Town Council, Larch Road and Coal Pit Lane sites; J. Walmsley, surveyor.

Lichfield.—Duplex flats (28), Stowe estate; L. Straw, city engineer.

Lincoln.—School canteens for St. Peter-at-Gowts Church Primary, Westgate County Primary, Spring Hill County Secondary Modern and St. Martin's Church Primary Schools (£12,500); city architect.

Lincoln.—Flats (65) and maisonnettes, Hartsholme estate; city housing architect, Stamp End.

Liverpool.—Flats (330), Mather Avenue estate; director of housing, Blackburn Chambers, Dale Street, Kingsway.

London.—Extensions to showrooms and warehouse, Tottenham Court Road; Catesbys, Ltd.

CAMBERWELL.—Blocks of flats, Denmark Road; Society for Improving Conditions of the Labouring Classes, 26, Bloomsbury Way, London, W.C.1.

SOUTHWARK.—Cold storage premises, Hopton Street; Co-operative Wholesale Society, Ltd., 99, Leman Street, E.1.

ST. PANCRAS.—Flats (40), St. Pancras Way, for B.C.; Perrys (Ealing), Ltd., builders, 75, Uxbridge Road, W.5

Lowestoft.—Houses (16), Mount Pleasant; J. Gaze & Sons, Ltd., builders, Kimberley Road Works.

Houses (22), Glendale Road; Norman Thompson, Ltd., builders, Stonehouse Street.

Middlesbrough.—Houses (56), Thorntree estate. Builders: G. H. Rogers, Stockton Road, Middlesbrough, 34 houses; and A. & R. Cubitt, Eastbourne Road, Middlesbrough, 22 houses.

Newcastle-on-Tyne.—Factory at Byker for Hampton Heating Co.; J. T. Bennison & Sons, Low Fell, Gateshead-on-Tyne.

Houses (14), Blackett-Ord estate, for the City Council; C. S. Hogg, Ltd., builders, 259, Two Ball Lonnen, Newcastle.

Houses (14), Slingsby Gardens; J. T. Bell & Son, builders, Brunswick Place, Newcastle.

Nottingham.—Houses (500), Strelley estate; city housing architect.

Plymouth.—Extension of factory, Prince Rock, for Disabled Persons Employment Corporation, Ltd.; Dudley Coles builder, Brooklands Lodge, Bainbridge Avenue.

Portsmouth.—Block of shops, showrooms and maisonettes, Palmerton Road, Southsea; city architect.

Rugby.—Houses (156), Newbold Glebe estate; borough surveyor.

Salisbury.—Flats (46), Bemerton Heath estate; city engineer.

Stockton-on-Tees.—Houses (20), Brisbane Grove; Fordy & Son, builders, Boathouse Lane, Stockton.

Swanscombe.—Houses (20) and flats (16), Manor Road; U.D.C. surveyor.

Waltham Cross.—Houses (98), Park Lane, for Edmonton B.C.; borough engineer, Town Hall, N.9.

York.—Old people's hostel on site at Acomb; Chas. J. Minter, city surveyor, Guildhall.

Wireless Licences

The number of broadcast receiving licences continues to increase. At the end of May last, there were 11,873,950 broadcast receiving licences current in Great Britain and Northern Ireland; this was an increase of 50,950 over April The number of television licences at the end of May was 140,850, an increase of 7,600.